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A source of information about earned degrees in the broad areas of the biological and physical sciences, mathematics, and engineering, as well as in the various specific disciplines within these areas. Data are presented on an annual basis in order to show trends, and totals are also given for the entire 11-year period, 1949–50 through 1959–60. Doctorate production by individual institution is given for the period 1949–50 through 1958–59.

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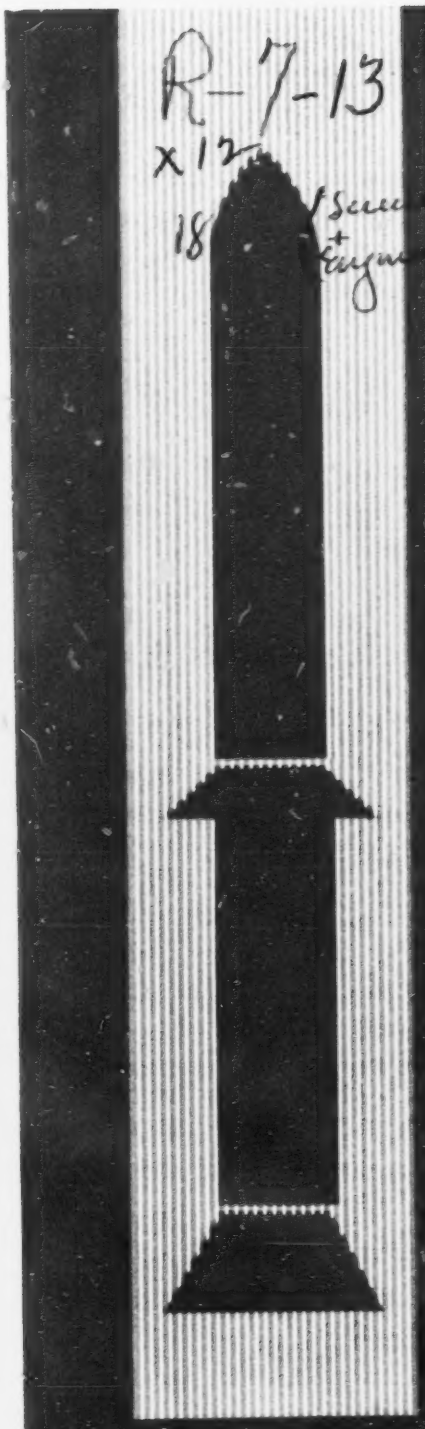

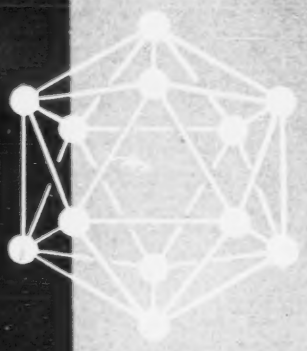

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DEGREES in the BIOLOGICAL and PHYSICAL SCIENCES, MATHEMATICS, and ENGINEERING:

1949-50 THROUGH 1959-60

CLARENCE B. LINDQUIST, *Specialist for Mathematics and Physical Sciences, Division of Higher Education*

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
ANTHONY J. CELEBREZZE, *Secretary*

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Foreword

BECAUSE OF THE importance of the biological and physical sciences, mathematics, and engineering to the national security and welfare, there has been increased interest in the number of graduates in these fields at all degree levels. At his news conference on January 15, 1962, President Kennedy quoted some statistics on the numbers of such degrees during the past decade and expressed his concern over what he considered inadequate rates of production, especially in view of USSR advances in these areas.

This publication is intended to serve as a source of ready information about earned degrees in the broad areas of the biological and physical sciences, mathematics, and engineering as well as in the various specific disciplines within these areas. Data are presented on an annual basis in order to show trends, and totals are also given for the entire 11-year period, 1949–50 through 1959–60. Doctorate production by individual institution is given for the period 1949–50 through 1958–59.

We wish to acknowledge the assistance of Dr. Henry H. Armsby, who recently retired from the Office of Education, in furnishing several of the tables and portions of the text in this bulletin dealing with engineering. Dr. Armsby has been author or co-author of the *Engineering Enrollments and Degrees* reports of the Office of Education since their inception in 1949.

It is hoped that this bulletin will be useful to those concerned with manpower problems, as well as those involved in the education of scientists and engineers.

R. ORIN CORNETT
Acting Assistant Commissioner for Higher Education

HAROLD A. HASWELL
Director, Higher Education Programs Branch

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Degrees in the Biological and Physical Sciences, Mathematics, and Engineering: 1949-50 Through 1959-60

Introduction

AFTER SHARP DECLINES during the first half of the 1950's, the numbers and percentages of degrees at the bachelor's and master's levels in the biological and physical sciences, mathematics, and engineering conferred in institutions of higher education in the United States steadily increased. The number of doctorates awarded in these fields, however, increased steadily during the entire period covered by this study, with not much change in the percentage that these degrees were of all degrees at the doctorate level. The numbers and percentages of degrees for each of these fields separately, as well as their combined totals, are shown in table 1 for each year from 1949–50 through 1959–60.

Source of data

The data in this bulletin were compiled from the annual *Earned Degrees Conferred: Bachelor's and Higher Degrees* and *Engineering Enrollments and Degrees* reports of the U.S. Office of Education. The data are for the aggregate United States (the 50 States, the District of Columbia, and the outlying parts, such as Puerto Rico).

In a few instances data were received too late to be included in the annual report, and these have been incorporated in later statistical reports, such as this one. Also, it has been a practice in the Office of Education in the compilation of trend reports to allocate one-half of the science degrees awarded in general program (without major field) to the biological sciences and one-half to the physical sciences. This practice has been followed here; consequently, totals for the biological sciences and the physical sciences will differ somewhat from the data in the separate annual reports.

More detailed classifications were introduced in 1956–57 and used thereafter, thus affecting the comparability of the data for these years with those of earlier years.

The annual degree reports of the Office of Education cover a period from July 1 of one year to June 30 of the next. No distinction is made between liberal arts degrees and those awarded in connection with preparation for teaching, and those of other categories. The criterion used is that there be a substantive major in the discipline concerned. A double major, with approximately equal concentration in two disciplines, is counted as one-half a degree in each discipline.

Because they show how certain fields and disciplines compare with others, percentages have been computed at the three degree levels. The percentages at the bachelor's level are based upon all bachelor's and first professional degrees. First professional degrees include, for example, doctors of medicine, doctors of dentistry, and bachelors of law. Second-level degrees include, along with master's degrees, all degrees, such as specialist degrees which are beyond the baccalaureate but less than doctorates. Doctor's degrees include, along with the doctor of philosophy (Ph. D.), the doctor of education (Ed. D.), the doctor of science (D. Sc.), and other similar degrees.

Bachelor's degrees

As shown in table 1, the 83,108 bachelor's degrees awarded in science, mathematics, and engineering in 1959–60 were still considerably less than the high figure of 101,298 in 1949–50. The 1959–60 figures for the biological sciences, physical sciences, and engineering, considered separately,

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Table 1.—Number and percent of degrees in the biological and physical sciences, mathematical subjects, and engineering, by level of degrees: Aggregate United States, each year 1949–50 through 1959–60

Year ending June 30	Number of degrees [1]						Degrees in sciences, mathematical subjects and engineering as percent of degrees in all fields				
	All fields	Sciences, mathematical subjects, and engineering									
		Totals	Biological sciences [2]	Physical sciences [3]	Mathematical subjects [4]	Engineering	Total, sciences, mathematics and engineering [5]	Biological sciences [2]	Physical sciences [3]	Mathematical subjects [4]	Engineering
Bachelor's and First Professional-Level Degrees											
1950	433,734	101,298	22,521	19,653	6,392	52,732	23.4	5.2	4.5	1.5	12.2
1951	384,352	82,417	18,868	15,903	5,753	41,893	21.4	4.9	4.1	1.5	10.9
1952	331,924	63,265	15,423	12,835	4,721	30,286	19.1	4.7	3.9	1.4	9.1
1953	304,857	53,994	14,068	11,366	4,396	24,164	17.7	4.6	3.7	1.4	7.9
1954	292,880	50,905	13,580	10,993	4,096	22,236	17.4	4.6	3.8	1.4	7.6
1955	287,401	50,672	12,847	11,202	4,034	22,589	17.6	4.5	3.9	1.4	7.9
1956	311,298	56,411	13,169	12,276	4,660	26,306	18.1	4.2	3.9	1.5	8.5
1957	340,347	64,975	14,576	13,642	5,546	31,211	19.1	4.3	4.0	1.6	9.2
1958	365,748	72,908	15,354	15,298	6,924	35,332	19.9	4.2	4.2	1.9	9.7
1959	385,151	79,707	16,122	16,432	9,019	38,134	20.7	4.2	4.3	2.3	9.9
1960	394,889	83,108	16,730	17,133	12,437	36,808	21.0	4.2	4.3	2.9	9.6
Master's and Other Second-Level Degrees											
1950	58,219	11,593	2,412	3,305	974	4,904	19.9	4.1	5.7	1.7	8.4
1951	65,132	12,185	2,603	3,317	1,109	5,156	18.7	4.0	5.1	1.7	7.9
1952	63,587	10,466	2,442	3,081	802	4,141	16.5	3.8	4.9	1.3	6.5
1953	61,023	9,103	1,994	2,689	677	3,743	14.9	3.3	4.4	1.1	6.1
1954	56,823	8,969	1,658	2,421	706	4,177	15.8	2.9	4.3	1.2	7.4
1955	58,204	9,515	1,668	2,602	761	4,484	16.4	2.9	4.5	1.3	7.7
1956	59,294	10,099	1,789	2,688	898	4,724	17.0	3.0	4.5	1.5	8.0
1957	61,955	10,798	1,849	2,752	965	5,232	17.4	3.0	4.4	1.6	8.5
1958	65,614	12,131	1,964	3,145	1,234	5,788	18.5	3.0	4.8	1.9	8.8
1959	69,497	13,785	2,177	3,356	1,499	6,753	19.8	3.1	4.8	2.2	9.7
1960	74,497	14,859	2,351	3,584	1,765	7,159	19.9	3.2	4.8	2.4	9.6
Doctor's Degrees											
1950	6,633	2,771	644	1,473	160	494	41.8	9.7	22.2	2.4	7.4
1951	7,338	3,217	795	1,652	184	586	43.8	10.8	22.5	2.5	8.0
1952	7,683	3,232	770	1,670	206	586	42.1	10.0	21.7	2.7	7.6
1953	8,309	3,460	968	1,659	241	592	41.6	11.7	20.0	2.9	7.1
1954	8,996	3,616	1,095	1,704	227	590	40.2	12.2	18.9	2.5	6.6
1955	8,840	3,560	996	1,715	250	599	40.3	11.3	19.4	2.8	6.8
1956	8,903	3,537	1,025	1,667	235	610	39.7	11.5	18.7	2.6	6.9
1957	8,756	3,627	1,106	1,676	249	596	41.4	12.6	19.1	2.8	6.8
1958	8,942	3,674	1,125	1,655	247	647	41.1	12.6	18.5	2.8	7.2
1959	9,360	3,859	1,048	1,815	282	714	41.2	11.2	19.4	3.0	7.6
1960	9,829	4,134	1,206	1,839	303	786	42.1	12.3	18.7	3.1	8.0

[1] A double major with approximately equal concentrations in two disciplines is counted as ½ for each discipline.

[2] Includes premedical, predental, and preveterinary sciences; biology, general; botany, general; anatomy and histology; bacteriology, virology, mycology, parasitology; biochemistry; biophysics; entomology; genetics (including experimental plant and animal breeding); optometry (preprofessional bachelor's degree); pathology (including plant pathology); physiology (including plant physiology); pharmacology (excluding pharmacy); and zoology; excludes forestry and agricultural sciences; includes allocations from sciences, general program (without major field).

[3] Includes astronomy; chemistry (excluding biochemistry); metallurgy (beginning with the year 1953–54); meteorology; physics; geology; geophysics; oceanography; earth sciences, other; physical sciences, general major; includes allocations from sciences, general program (without major field).

[4] Includes mathematics, statistics, and actuarial science.

[5] Total does not necessarily equal the sum of components due to rounding.

were substantially below those for 1949–50. Only the mathematical subjects (mathematics, statistics, and actuarial science) showed an increase. In fact, in recent years the mathematical subjects have been the most rapidly growing field among the major disciplines.

The percent of degrees at the bachelor's level for the combined fields of the biological and physical sciences, mathematics, and engineering decreased from a high of 23.4 in 1949–50 to 17.4 in 1953–54 but climbed steadily thereafter, reaching 21.0 in 1959–60. Thus, even with the steady increase since 1953–54, the science, mathematics, and engineering fields had not become as popular as they were in 1949–50 when 234 out of every 1,000 bachelor's and first professional degrees were awarded in them.

Considering the fields separately, the biological sciences lost ground at the bachelor's level, decreasing from 5.2 percent in 1949–50 to 4.2 percent

by 1959–60; the percent in the physical sciences dropped from 4.5 in 1949–50 to 3.7 in 1952–53 and increased to 4.3 in 1959–60; the mathematical subjects gained, from 1.5 percent in 1949–50 to 2.9 percent by 1959–60, with a great increase coming in the last years; and in engineering the percent dropped from 12.2 in 1949–50 to 7.6 in 1953–54 and then increased to a little less than 10 by the end of the period covered by this study.

Reasons for declines in bachelor's degrees

The decline in the number of bachelor's degrees earned in science, mathematics, and engineering during the first half of the 1950's was brought about by more than one factor. First, the decline was part of a general decline in degrees earned in all subject fields, the result of the low birth rates of the 1930's, which reduced the number of college-age youth in the early 1950's. Second, the "veterans' bulge" from World War II reached its peak in graduations in 1949–50 and then began to taper off. Just at this time the Korean conflict took some young men who would normally have been in college. Finally, the decreasing popularity of the sciences, mathematics, and engineering during the first half of the fifties, as indicated by their decreasing percentage of all degrees, contributed to the reduced number of baccalaureates in these fields.

Reports circulated around 1950 that there was an oversupply of engineers were undoubtedly an important factor in the sharp decrease in the number of engineering baccalaureates—from 52,732 in 1949–50 to 22,236 in 1953–54. By 1958–59 the number had risen again, but only to 38,134, and then decreased in 1959–60 to 37,808.

Master's degrees

The number of master's and other second-level degrees in the combined fields of the biological and physical sciences, mathematics, and engineering decreased from 11,595 in 1949–50 to 8,962 in 1953–54 before starting a climb to 14,859 in 1959–60. During this period the percentage dropped from 19.9 in 1949–50 to 14.9 in 1952–53 before returning to 19.9 again in 1959–60.

Each of the fields considered separately underwent declines in both numbers and percents during the first part of the period, followed by climbs during the last part of the period. Except for the number of degrees in the biological sciences and the percents of degrees in the biological and physical sciences, the numbers and percents reached by 1959–60 had exceeded the corresponding figures of 1949–50. The 7,159 master's and second-level degrees in engineering in 1959–60 were almost one-half of the degrees awarded at this level that year. The mathematical subjects experienced the greatest relative gain, from 974 degrees in 1949–50 to 1,765 degrees in 1959–60, after a brief decline to 677 degrees in 1952–53.

Doctor's degrees

The number of doctor's degrees awarded in the combined fields of the biological and physical sciences, mathematics, and engineering increased almost steadily from 2,771 in 1949–50 to 4,134 in 1959–60. The percentage of doctorates in these fields to doctorates in all fields reached a high of 43.8 in 1950–51, followed by a decrease to 39.7 in 1955–56, and a rise thereafter to 42.1 in 1959–60.

Considering the fields separately, the greatest relative gains were made in the biological sciences and in the mathematical subjects, with the number in the biological sciences increasing from 644 in 1949–50 to 1,206 in 1959–60 and the number in the mathematical subjects from 160 to 303 in the same period. The percentages likewise increased. Although the number of doctorates in the physical sciences increased from 1,473 in 1949–50 to 1,839 in 1959–60, the corresponding percent declined from 22.2 to 18.7 over these same years. After an increase from 494 doctorates in engineering in 1949–50 to 586 doctorates in 1950–51, the number remained almost constant for 7 years, until 1957–58 when an upswing occurred, reaching 786 doctorates in 1959–60. Engineering doctorates declined in relation to the total number of doctorates from 8.0 in 1950–51 to 6.6 in 1953–54 and then climbed back to 8.0 by 1959–60.

Totals for the 11-year period

Table 2 shows the distribution of earned degrees in the biological and physical sciences, mathematics, and engineering based on totals for the

Table 2.—Number of degrees in the biological and physical sciences, mathematical subjects, and engineering; percent distribution of those degrees; and degrees granted to women as percent of degrees granted to both sexes; by field and level of degrees: Aggregate United States, totals for 1949–50 through 1959–60

[L=less than .05 percent but not zero percent]

Field or subject	Number of degrees			Percent distribution of degrees			Degrees granted to women as percent of degrees to both sexes		
	Bachelor's and first professional level	Master's and other second level	Doctor's level [1]	Bachelor's and first professional level	Master's and other second level	Doctor's level [1]	Bachelor's and first professional level	Master's and other second level	Doctor's level [1]
All fields	**3,832,581**	**693,845**	**93,589**	**100.0**	**100.0**	**100.0**	**32.6**	**31.9**	**9.9**
All biological and physical science, mathematics, and engineering	**760,562**	**123,290**	**38,948**	**19.8**	**17.8**	**41.5**	**10.3**	**8.0**	**5.3**
Biological sciences [2]	**173,337**	**23,155**	**11,005**	**4.5**	**3.3**	**11.8**	**22.4**	**20.4**	**11.0**
Anatomy and histology	950	604	334	L	0.1	0.4	8.9	19.5	16.2
Bacteriology	5,946	2,957	1,363	0.2	0.4	1.5	44.0	23.4	12.8
Biochemistry, virology, mycology, parasitology	1,549	1,507	1,484	L	0.2	1.6	14.3	22.2	11.9
Biology, general	76,928	5,532	1,485	2.0	0.8	1.6	28.1	25.6	14.3
Botany, general	3,784	2,455	1,695	0.1	0.4	1.8	30.0	23.4	10.4
Entomology	1,023	1,198	732	L	0.2	0.8	5.9	3.2	1.2
Physiology (except plant)	1,121	1,195	786	L	0.2	0.8	48.8	16.7	11.5
Zoology, general	23,199	4,443	1,802	0.6	0.6	1.9	22.9	21.0	11.8
Biological science, other	58,837	3,264	1,324	1.5	0.5	1.4	12.3	13.1	8.2
Physical sciences [3]	**156,733**	**32,940**	**18,525**	**4.1**	**4.8**	**19.8**	**12.3**	**8.5**	**3.7**
Astronomy	253	178	170	L	L	0.2	20.6	11.8	10.1
Chemistry	78,040	13,638	11,032	2.0	2.0	11.8	17.8	12.6	4.7
Geology	25,726	5,936	1,542	0.7	0.9	1.6	3.6	3.0	2.1
Meteorology	1,256	672	132	L	0.1	0.1	2.3	1.9	2.3
Physics	30,815	9,295	5,116	0.8	1.3	5.5	4.1	3.7	1.9
Physical science, other	20,643	3,221	533	0.5	0.5	0.6	14.9	16.1	4.3
Mathematical subjects [4]	**66,978**	**11,390**	**2,584**	**1.8**	**1.6**	**2.8**	**28.4**	**18.8**	**5.4**
Engineering	**363,514**	**55,805**	**6,734**	**9.5**	**8.0**	**7.2**	**0.3**	**0.3**	**0.2**
Chemical	31,878	6,268	1,652	0.8	0.9	1.8	0.5	0.4	0.1
Civil	57,134	8,242	540	1.5	1.2	0.6	0.2	0.3	0.2
Electrical	88,592	14,191	1,502	2.3	2.1	1.6	0.2	0.2	0.5
Industrial	22,361	4,053	93	0.6	0.6	0.1	0.2	0.3	1.1
Mechanical	92,739	9,326	809	2.4	1.3	0.9	0.1	0.2	0.1
Engineering, other	70,810	13,725	2,138	1.9	2.0	2.3	0.5	0.6	0.2

[1] Ph.D., Ed.D., etc.

[2] Includes premedical, predental, and preveterinary sciences. Does not include the agricultural sciences, forestry, or the behavioral sciences.

[3] Includes metallurgy (only from 1950–54 on), geophysics, oceanography, and other earth sciences.

[4] Consists of mathematics, statistics, and actuarial science.

11-year period of this study. From this table it is seen that degrees in the combined fields of the biological and physical sciences, mathematical subjects, and engineering constituted 19.8 percent of all bachelor's and first professional degrees, 17.8 percent of all master's and other second-level degrees, and 41.5 percent of all doctorates. The fact that relatively few of the large number of professional degree recipients go on for higher degrees and the fact that large numbers of master's degrees are earned in education likely account for the drop from 19.8 percent at the bachelor's level to 17.8 percent at the master's level. The high figure of 41.5 percent at the doctorate level indicates that a large percentage, relative to other fields, of those who go on to graduate work in science, mathematics, and engineering, go on to the doctorate. This is particularly true in the physical sciences (especially in chemistry) with percents of 4.1, 4.8, and 19.8 at the bachelor's, master's, and doctoral levels, respectively.

At the bachelor's and master's level engineering accounted for a little less than half of the total number of degrees in science, mathematics, and engineering; at the doctoral level the physical sciences accounted for nearly half of all the doctorates conferred in these fields, primarily because of the large number of doctorates awarded each year in chemistry.

Degrees conferred upon women

Table 3 gives the annual numbers and percents of degrees at each of the three levels conferred

upon women in the biological and physical sciences, mathematics, and engineering. It is seen from the table that the number of bachelor's degrees conferred upon women in the combined fields of science, mathematics, and engineering declined from 8,124 in 1949–50 to 5,886 in 1954–55 and by 1960 had risen to 9,684. At the master's level, the pattern was similar to that at the bachelor's, with a decline from 991 in 1949–50 to 654 in 1953–54 followed by a rise to 1,250 by 1959–60. At the doctoral level there was a somewhat erratic increase in the number of degrees, with a low of 150 in 1949–50 and a high of 223 in 1957–58.

During the first half of the 1950's, the percentage of science, mathematics, and engineering degrees awarded to women at the bachelor's level based on degrees to both sexes increased from 8.0 percent to 11.9 percent. At the same time the percentage of women receiving degrees in these fields based on the total number of all women graduates alone decreased from 7.8 percent to 5.7 percent. In other words, women were awarded a larger portion of these degrees while at the same time out of every hundred women graduates fewer were majors in science, mathematics, or engineering.

Table 3.—Number of degrees granted to *women* in the biological and physical sciences, mathematical subjects, and engineering; and these degrees taken as percent of degrees in same fields granted to both sexes, and as percent of degrees in all fields granted to women; by fields: Aggregate United States, each year 1949–50 through 1959–60

[L=less than .05 percent but not zero percent]

Year ending June 30	Number of degrees granted to women [1]					These degrees as percent of degrees in same fields granted to both sexes					These degrees as percent of degrees in all fields granted to women [2]				
	Total	Biological science	Physical science	Mathematical subjects	Engineering	Total	Biological science	Physical science	Mathematical subjects	Engineering	Total	Biological science	Physical science	Mathematical subjects	Engineering
BACHELOR'S LEVEL															
1950	8,124	4,450	2,046	1,446	182	8.0	19.8	10.4	22.6	0.3	7.8	4.3	2.0	1.4	0.2
1951	7,057	3,891	1,635	1,442	89	8.6	21.2	10.3	25.1	0.2	6.7	3.7	1.6	1.4	0.1
1952	6,385	3,416	1,577	1,332	60	10.0	22.1	12.3	28.2	0.2	6.1	3.3	1.5	1.3	0.1
1953	5,912	3,140	1,461	1,274	37	10.9	22.7	12.9	29.0	0.2	5.7	3.0	1.4	1.2	0.0
1954	6,066	3,141	1,492	1,368	65	11.9	23.1	13.6	33.4	0.3	5.8	3.0	1.4	1.3	0.1
1955	5,886	2,962	1,552	1,310	62	11.6	23.1	13.9	32.5	0.3	5.7	2.9	1.5	1.3	0.1
1956	6,367	3,113	1,655	1,523	76	11.3	24.4	13.6	32.7	0.3	5.7	2.8	1.5	1.4	0.1
1957	6,836	3,283	1,752	1,720	81	10.5	22.5	12.8	31.0	0.3	5.8	2.8	1.5	1.5	0.1
1958	7,327	3,380	1,867	1,971	109	10.0	22.0	12.2	28.5	0.3	6.0	2.8	1.5	1.6	0.1
1959	8,454	3,849	1,969	2,515	121	10.6	23.9	12.0	27.9	0.3	6.5	3.0	1.5	1.9	0.1
1960	9,684	4,180	2,234	3,125	145	11.7	25.0	13.0	27.3	0.4	7.0	3.0	1.6	2.2	0.1
MASTER'S AND OTHER SECOND-LEVEL															
1950	991	489	296	190	16	8.8	20.3	9.0	19.5	0.3	5.8	2.9	1.7	1.1	0.1
1951	915	477	248	180	10	7.6	18.3	7.5	16.2	0.2	4.8	2.5	1.3	1.0	0.1
1952	818	418	243	139	18	7.8	17.1	7.9	17.3	0.4	4.1	2.1	1.2	0.7	0.1
1953	667	362	180	112	13	7.4	18.2	6.7	16.5	0.4	3.3	1.8	0.9	0.6	0.1
1954	654	329	183	127	15	7.3	19.8	7.6	21.0	0.4	3.5	1.8	1.0	0.7	0.1
1955	773	395	217	148	13	8.1	23.7	8.3	19.4	0.3	4.0	2.0	1.1	0.8	0.1
1956	798	381	223	175	19	7.9	21.2	8.3	19.9	0.4	4.0	1.9	1.1	0.9	0.1
1957	809	376	229	188	16	7.5	20.0	8.3	19.5	0.3	3.9	1.8	1.1	0.9	0.1
1958	974	424	290	240	20	8.0	21.4	9.2	19.4	0.3	4.6	2.0	1.4	1.1	0.1
1959	1,149	501	313	311	24	8.3	22.8	9.3	20.7	0.4	5.2	2.3	1.4	1.4	0.1
1960	1,250	523	364	337	26	8.4	22.2	10.2	19.1	0.4	5.3	2.2	1.5	1.4	0.1
DOCTOR'S LEVEL															
1950	150	89	51	9	1	5.5	13.8	3.7	5.6	0.2	23.3	13.8	7.9	1.4	0.2
1951	173	98	65	9	1	5.4	12.3	4.0	4.9	0.2	25.7	14.5	9.6	1.3	0.2
1952	155	84	56	11	4	4.8	10.9	3.5	5.3	0.7	21.7	11.8	7.8	1.5	0.6
1953	195	118	62	14	1	5.7	12.2	3.8	5.8	0.2	24.6	14.9	7.8	1.8	0.1
1954	179	102	63	14	0	4.9	9.3	3.9	6.2	L	22.0	12.5	7.7	1.7	0.0
1955	162	99	52	11	0	4.6	9.9	3.1	4.4	L	19.6	12.0	6.3	1.3	0.0
1956	195	117	68	10	0	5.5	11.4	4.2	4.3	L	22.0	13.2	7.7	1.1	0.0
1957	197	112	71	13	1	5.4	9.9	4.3	5.2	0.2	21.0	11.9	7.6	1.4	0.1
1958	223	138	66	15	4	6.1	10.6	4.2	6.1	0.6	23.1	14.3	6.9	1.6	0.4
1959	197	112	69	15	1	5.1	10.7	4.0	5.3	0.1	19.9	11.3	7.0	1.5	0.1
1960	202	119	62	18	3	4.9	9.9	3.4	5.9	0.4	19.7	11.6	6.0	1.8	0.3

[1] See footnote to table 2 for the subjects which are included in the biological, the physical sciences, the mathematical subjects, and engineering.

[2] For example, at the bachelor's level the percent for each year is based upon all the bachelor's and first professional degrees conferred that year.

In the latter half of the decade, however, the percentage, at the bachelor's level, of women graduates in science, mathematics, and engineering in relation to the total number of women graduates began to increase, indicating a revival of women's interest in the sciences and technology. However, the percentage of 7 reached in 1959–60 does not duplicate the high figure of 7.8 percent attained in 1949–50.

Although women received about 1 out of every 3 bachelor's and first professional degrees, of the total number granted in all fields they received only slightly more than 1 out of 10 degrees in the combined areas of science, mathematics, and engineering. At the master's level, the comparable figures are about 1 out of 3 and about 1 out of 12; and at the doctoral level, about 1 out of 10 and 1 out of 20, respectively. The percentage of degrees to women in the sciences, mathematics, and engineering decreases for each higher level, proving that proportionately fewer women go on to advanced degrees in these fields.

Considering the sciences, mathematics, and engineering alone, mathematics at the bachelor's and master's levels and the biological sciences at all three levels are relatively the most popular fields among women. (See table 2.) Chemistry is by far the most popular discipline of the physical sciences among women. There are relatively few women majoring in geology or physics. A degree for a woman in engineering is rather infrequent. Only about 3 in 1,000 degrees in engineering go to women at either the bachelor's or master's level, and only about 2 in 1,000 at the doctorate level.

Doctorate production, by institution

Table 4 gives the doctorate production by individual institution for the combined fields of the biological sciences, the physical sciences, the mathematical subjects, and engineering over the period 1949–50 through 1958–59. Doctorate production in each of these separate component fields is given in the sections dealing with these fields. The totals given here also include, for several institutions, a few degrees which are classified as sciences, general program (without specific major).

The 135 institutions are listed in decreasing order of the number of doctorates each awarded over the 10-year period in science, mathematics, and engineering. Also shown, for comparative purposes, are the total number of doctorates each institution awarded in all fields over this same period and the corresponding rank order among the 208 institutions which granted doctorates in any field whatsoever.

The doctorate production by institution covers only the period 1949–50 through 1958–59 whereas other data in this report cover the period 1949–50 through 1959–60. At the time the manuscript was being prepared, degree data were available by field of study but not by individual institution for the year 1959–60.

Table 4.—Rank order of institutions with respect to total number of doctorates granted during 1949–50 through 1958–59 in the biological and physical sciences, mathematical subjects, and engineering, and all fields: Aggregate United States

Institution	All biological and physical sciences, mathematics and engineering [1] (135 institutions)		Doctorates in all fields (208 institutions)		Institution	All biological and physical sciences, mathematics and engineering [1] (135 institutions)		Doctorates in all fields (208 institutions)	
	Number of degrees	Rank order	Number of degrees	Rank order		Number of degrees	Rank order	Number of degrees	Rank order
University of California (all campuses)	2,432	1	4,364	2	University of Chicago	853	11	2,593	8
Massachusetts Institute of Technology	1,627	2	1,659	16	University of Minnesota	795	12	2,167	11
University of Illinois	1,603	3	2,960	5	Yale University	751	13	2,012	12
University of Wisconsin	1,577	4	3,477	3	Iowa State University (Ames)	723	14	1,105	23
University of Michigan	1,179	5	2,619	6	Stanford University	716	15	1,802	13
Ohio State University	1,144	6	2,530	9	New York University	653	16	2,610	7
Columbia University	1,039	7	5,483	1	California Institute of Technology	634	17	634	37
Cornell University	1,023	8	2,411	10	University of Texas	615	18	1,356	19
Harvard University	1,008	9	3,190	4	Pennsylvania State University	585	19	1,258	22
Purdue University	999	10	1,721	14					

See footnotes at end of table.

Table 4.—Rank order of institutions with respect to total number of doctorates granted during 1949–50 through 1958–59 in the biological and physical sciences, mathematical subjects, and engineering, and all fields: Aggregate United States—Continued

Institution	All biological and physical sciences, mathematics and engineering [1] (135 institutions)		Doctorates in all fields (208 institutions)	
	Number of degrees	Rank order	Number of degrees	Rank order
Princeton University	557	20	986	27
University of Pennsylvania	502	21	1,408	18
State University of Iowa	490	22	1,581	17
Northwestern University	471	23	1,311	20
Michigan State University	435	24	1,102	24
Carnegie Institute of Technology	417	25	417	47
Johns Hopkins University	409	26	831	31
University of Washington	407	27	893	28
Polytechnic Institute of Brooklyn	371	28	375	53
University of Rochester	371	28	627	38
University of North Carolina (all campuses)	358	30	1,042	25
University of Maryland	347	31	716	34
Rutgers, The State University	342	32	650	35
Indiana University	330	33	1,709	15
University of Pittsburgh	312	34	1,003	26
Duke University	295	35	650	35
Washington University	286	36	476	44
University of Notre Dame	282	37	358	56
Brown University	274	38	392	50
University of Kansas	265	39	522	42
University of Utah	254	40	403	48
Oregon State University	247	41	397	49
Illinois Institute of Technology	239	42	254	69
University of Southern California	228	43	1,275	21
University of Colorado	215	44	563	40
University of Missouri	210	45	720	33
Syracuse University	205	46	834	30
University of Delaware	201	47	201	79
University of Florida	199	48	564	39
University of Tennessee	198	49	361	55
Catholic University of America	195	50	839	29
University of Virginia	194	51	391	51
Louisiana State University	187	52	435	46
St. Louis University	185	53	348	57
Agricultural & Mechanical College of Texas	159	54	273	67
Lehigh University	158	55	169	83
Fordham University	156	56	540	41
Case Institute of Technology	156	54	156	85
University of Cincinnati	155	58	248	71
Rensselaer Polytechnic Institute	147	59	161	84
University of Oklahoma	146	60	374	54
Western Reserve University	143	61	446	45
Georgetown University	142	62	331	58
Rice University	141	63	156	85
Vanderbilt University	134	64	318	59
Kansas State University	133	65	173	82
George Washington University	132	66	252	70
Boston University	130	67	760	32
Tulane University	119	68	211	76
Wayne State University	119	68	285	64
University of Nebraska	115	70	480	43
Washington State University	115	70	284	65
Oklahoma State University	108	72	222	74
University of Buffalo	93	73	287	61
University of Connecticut	88	74	237	72
Virginia Polytechnic Institute	84	75	85	96
University of Oregon	80	76	287	61
Florida State University	77	77	224	73
University of Kentucky	73	78	278	66
Radcliffe College	72	79	290	60
Emory University	70	80	109	91
Lawrence College (Institute of Paper Chemistry)	70	80	70	103
Georgia Institute of Technology	66	82	66	105
West Virginia University	65	83	80	99
Temple University	52	84	287	61
University of New Mexico	48	85	107	93
Colorado School of Mines	45	86	48	117
University of Alabama	39	87	99	94
University of Massachusetts	34	88	110	90
University of Arizona	31	89	54	111
Clark University	29	90	189	81
Loyola University, Chicago	29	90	125	88
University of Louisville	28	92	28	132
Jefferson Medical College of Philadelphia	26	93	27	133
Baylor University	21	94	30	131
University of Georgia	20	95	50	115
Bryn Mawr College	19	96	83	98
University of Wyoming	15	97	116	89
Philadelphia College of Pharmacy & Science	15	97	24	135
University of Hawaii	15	97	15	147
Montana State College	14	100	15	147
Colorado State University	12	101	12	154
Auburn University	11	102	38	126
University of New Hampshire	11	102	15	147
George Peabody College for Teachers	11	102	264	68
Utah State University	10	105	42	121
Medical College of South Carolina	10	105	16	143
Medical College of Virginia	10	105	14	150
Duquesne University	9	108	10	160
Tufts University	8	109	74	101
University of North Dakota	7	110	64	106
University of South Carolina	7	110	23	137
Hahnemann Medical College and Hospital	6	112	7	166

See footnote at end of table.

Table 4.—Rank order of institutions with respect to total number of doctorates granted during 1949–50 through 1958–59 in the biological and physical sciences, mathematical subjects, and engineering, and all fields: Aggregate United States—Continued

Institution	All biological and physical sciences, mathematics and engineering [1] (135 institutions)		Doctorates in all fields (208 institutions)	
	Number of degrees	Rank order	Number of degrees	Rank order
Claremont Graduate School	5	113	54	111
University of Akron	5	113	5	173
The Rockefeller Institute	5	113	5	173
Howard University	5	113	5	173
University of Alaska	4	117	4	177
Stevens Institute of Technology	4	117	4	177
American University	4	117	192	80
Texas Technological College	4	117	39	124
Alfred University	3	121	3	182
St. John's University	3	121	69	104
Union College and University	3	121	10	160
University of Arkansas	2	124	88	95
Smith College	2	124	2	188
University of Mississippi	2	124	32	130
St. Bonaventure University	2	124	10	160
College of Medical Evangelists	1	128	1	192
U.S. Naval Postgraduate School	1	128	1	192
Bradley University	1	128	53	113
Brandeis University	1	128	9	163
New Mexico Institute of Mines and Technology	1	128	1	192
Adelphi College	1	128	41	123
Upstate Medical Center, State University of New York	1	128	1	192
Ohio University	1	128	1	192

[1] The number of degrees given here is the sum of the numbers of the degrees in the biological sciences, the physical sciences, the mathematical subjects, and engineering plus, for several institutions, a small number of degrees in science without major, or without major indicated.

The University of California (all campuses) heads the list with 2,432 degrees in the biological and physical sciences, mathematics, and engineering, followed by Massachusetts Institute of Technology with 1,627, University of Illinois with 1,603, and University of Wisconsin with 1,577. On the basis of doctorates in all disciplines, however, Columbia University leads with 5,483, followed by University of California (all campuses) with 4,364, University of Wisconsin with 3,477, and Harvard University with 3,190.

The Biological Sciences

FOR THE 11-year period as a whole, the 173,337 degrees conferred in the biological sciences at the bachelor's level constituted 4.5 percent of the total number of bachelor's and first professional degrees conferred in all disciplines. (See table 2.) The 23,155 master's degrees were 3.3 percent of all master's and second-level degrees awarded. The 11,005 doctor's degrees were 11.8 percent of all earned doctorates (Ph. D., Ed. D., etc.). As mentioned above, the large numbers of students earning first professional degrees who normally do not secure master's degrees and the large numbers of master's degrees awarded in education primarily account for the reduced percent at the master's level compared to the bachelor's level.

Biological science degrees, as a percent of all degrees, declined slightly during the 11-year period at both the baccalaureate and the master's degree levels. (See table 1.) During this same period, however, at the doctorate level the percent rose.

While the biological sciences were chosen as majors for the baccalaureate by large numbers of students, only about one-eighth as many secured the master's degree. For the doctorate this fraction fell to about one-sixteenth of the number securing the baccalaureate in the biological sciences. The biological sciences, over the 11-year period of this study, provided more popular major fields than either the physical sciences or mathematics at the baccalaureate level, but they were second to the physical sciences at both the master's and doctor's levels.

Number of degrees conferred in selected areas[1]

During this 11-year period the number of conferred baccalaureate degrees in each of the biological sciences, included in table 5, decreased sharply during the first half of the period, in most cases reaching lows in the years 1954–55 or 1955–56. The annual number of conferred baccalaureate degrees then increased for all of these disciplines except physiology, although in no case have the 1959–60 totals reached the 1949–50 totals. During the last year of the study (1959–60) decreases were recorded for anatomy, biochemistry, entomology, and physiology degrees.

During the early years of this same period the annual numbers of conferred master's degrees in the biological science specializations, as well as in biology, general, were greatly reduced, but by the end of the 11-year period the totals for anatomy, entomology, and biology, general, exceeded the 1949–50 figures.

The annual number of conferred doctorates in the several biological sciences rose and fell in rather erratic fashion during the 11-year period, but, for each discipline listed in table 5 the general increase resulted in a considerably larger figure in 1959–60 than in 1949–50. This differs significantly from the situation for both baccalaureate and master's degrees, which did not attain their 1949–50 levels, other than the exceptions at the master's level indicated in the preceding paragraph.

Distribution of degrees for the 11-year period

The numbers of degrees in the various biological sciences and the corresponding percents of all degrees at each level for the entire period covered by this study are shown in table 2. Figure 1 shows the distribution of the degrees at each level among selected specializations within the biological sciences. At the baccalaureate level 44.4 percent of the degrees in biological science represents major work done in the broad interdisciplinary field of biology. One would expect this

[1] For two reasons separate treatment of each major specialization in the biological sciences is not carried out in this publication as is done for each major specialization of the physical sciences. First, more detailed classifications were introduced beginning with the 1956–57 report, making it difficult to produce comparable data for the entire period covered by this study. Second, it is suspected that some of the degrees reported as biology, general, especially at the higher degree levels, should have been more properly placed by responding registrars in one of the biological science specializations.

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BIOLOGICAL SCIENCES

Table 5.—Number of degrees granted in selected fields among the *biological sciences*, by level of degrees: Aggregate United States, each year 1949–50 through 1959–60

[Beginning in 1956–57, more detailed classifications were introduced and used thereafter, thus affecting the comparability of the data for these years with those of the earlier years]

Year ending June 30	Biology, general [1]	Botany, general	Zoology, general	Anatomy and Histology	Bacteriology, etc.[2]	Biochemistry	Entomology	Physiology (except plant)
	Bachelor's Level							
1950	10,428	494	3,289	123	870	175	127	133
1951	8,797	410	2,667	94	730	198	106	152
1952	6,960	346	2,034	105	566	150	58	116
1953	5,959	290	1,746	86	527	128	85	95
1954	5,847	293	1,696	53	439	195	61	98
1955	5,493	302	1,648	75	414	144	61	100
1956	5,001	285	1,769	43	426	48	78	93
1957	5,688	295	1,993	52	422	107	104	97
1958	6,812	334	1,980	59	515	150	88	87
1959	7,534	365	2,127	138	504	146	147	87
1960	8,409	370	2,250	122	533	108	108	63
	Master's and Other Second-Level							
1950	549	299	551	65	327	144	89	147
1951	604	270	649	71	349	149	113	153
1952	570	254	569	64	321	175	110	136
1953	478	195	441	59	291	120	95	117
1954	435	197	323	47	242	105	83	93
1955	446	173	264	29	233	142	116	88
1956	369	183	293	56	249	155	106	107
1957	457	209	309	45	244	101	121	78
1958	470	236	310	40	249	156	108	94
1959	537	245	370	59	204	117	136	95
1960	617	194	364	69	248	143	121	87
	Doctor's Level							
1950	81	126	125	15	74	116	52	36
1951	140	147	123	19	105	113	55	75
1952	132	101	154	34	92	99	56	63
1953	170	147	172	34	116	142	64	97
1954	147	171	221	33	131	145	55	85
1955	150	151	196	37	131	147	66	57
1956	109	162	148	38	140	146	62	71
1957	138	197	174	25	148	123	72	83
1958	130	173	160	35	160	149	83	87
1959	147	185	144	37	125	139	70	63
1960	141	135	185	27	141	165	97	69

[1] Data presented are those compiled from registrars' reports. A number of degrees reported as biology, general, should properly have been assigned to other biological specializations, but this was not done by several institutions.

[2] Includes virology, mycology, and parasitology.

high percentage because (1) the biology department is the most common type of biological science department and (2) many institutions provide interdepartmental majors consisting of undergraduate work in several biological science departments. Concentrated study in a single biological specialty, such as anatomy or entomology, at the undergraduate level, is not common, as indicated by the low percentages for baccalaureate degrees for these specialties. Increasing specialization, however, is reflected in higher percentages of degrees in biological science specialties at both the master's and doctorate levels.

Number of institutions awarding degrees in the biological sciences

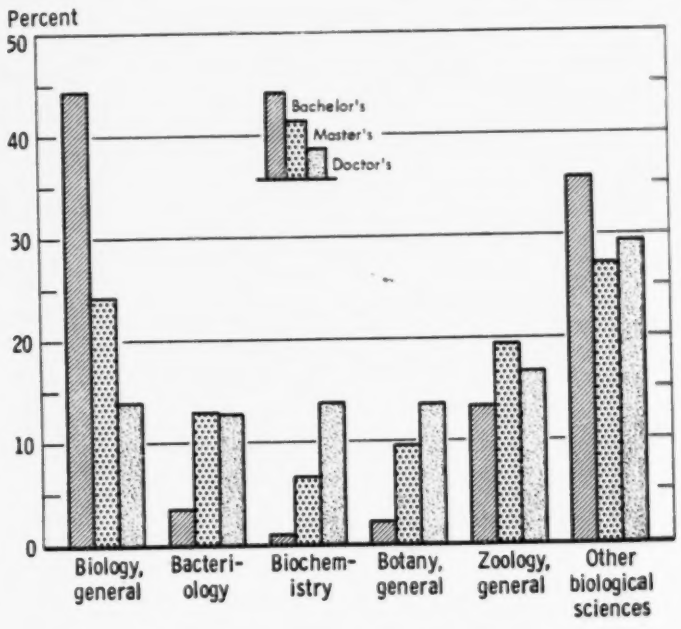
Beginning with 1956–57 survey, the Office of Education published the figures for the total number of institutions that conferred degrees in the biological sciences at each of the three degree levels. During the 4 years that such data has been secured, the number of institutions conferring baccalaureate degrees in the biological sciences has risen steadily from 860 in 1956–57 to 912 in 1959–60. At the master's level the rise in number of institutions was from 193 to 226; and at the doctorate level, from 90 to 103. It must be remembered, however, that the number of institutions that conferred degrees in biological science at a given level for a given year will not usually represent the total number of institutions authorized to grant such degrees because some institutions lack students completing the requirements for such a degree.

Doctorate production in the biological sciences, by institution

Table 6 shows the total number of doctorates in the biological sciences awarded by individual institutions for the 10-year period of 1949–50 through 1958–59. The 113 different institutions which awarded the degree are ranked in decreasing order, based upon the total number of doctorates each institution awarded during the 10-year period. The first 30 institutions granted slightly more than 75 percent of all doctorates in the biological sciences during this 10-year period; the first 15 institutions conferred almost 55 percent (54.8) of these degrees.

Although the University of California heads the list with 960, it should be pointed out that this number includes the total for all campuses of its entire university system. If such data were combined by other states, Michigan, Iowa, and Indiana would be very high in the list.

Figure 1.—Percentage distribution of degrees within the biological sciences: Aggregate United States, 1949–50 through 1959–60



BIOLOGICAL SCIENCES

Table 6.—Rank order of institutions with respect to total number of doctorates in the *biological sciences* granted during 1949–50 through 1958–59: Aggregate United States

Rank order	Institution	10-year total	Rank order	Institution	10-year total
1	University of California (all campuses)	960	56	Radcliffe College	42
2	University of Wisconsin	720	59	Brown University	39
3	Cornell University	456	59	Vanderbilt University	39
4	University of Michigan	390	61	Emory University	32
5	University of Illinois	344	62	University of Notre Dame	31
6	Ohio State University	331	62	University of Virginia	31
7	University of Chicago	300	64	Florida State University	28
8	University of Minnesota	293	65	University of Connecticut	27
9	Purdue University	214	65	University of Buffalo	27
10	University of Iowa	205	65	Loyola University (Chicago)	27
11	Columbia University	204	68	Jefferson Medical College of Philadelphia	26
12	Iowa State University	199	69	University of Cincinnati	25
13	Harvard University	189	70	West Virginia University	23
14	Rutgers, The State University	188	71	University of Oregon	22
15	University of Pennsylvania	182	72	Rice University	21
16	Michigan State University	180	73	University of Massachusetts	19
17	New York University	172	74	Virginia Polytechnic Institute	18
18	Yale University	158	75	University of Alabama	17
19	University of Rochester	151	76	Philadelphia College of Pharmacy and Science	15
19	University of Texas	151	77	Baylor University	13
21	Stanford University	145	78	Lehigh University	12
22	University of Maryland	140	79	Georgetown University	11
23	Oregon State University	119	80	Medical College of South Carolina	10
24	Duke University	111	80	University of New Mexico	10
25	University of Southern California	110	80	University of Hawaii	10
26	Pennsylvania State University	106	80	Medical College of Virginia	10
27	George Washington University	105	84	Illinois Institute of Technology	9
28	University of Kansas	103	84	University of Kentucky	9
29	Indiana University	99	86	Tufts University	8
29	Washington University	99	87	Wayne State University	7
31	University of North Carolina	86	87	University of Arizona	7
32	University of Washington	80	87	University of Georgia	7
33	Agricultural and Mechanical College of Texas	79	90	Hahnemann Medical College and Hospital	6
34	Johns Hopkins University	78	91	Auburn University	5
35	Louisiana State University	77	91	Claremont Graduate School	5
35	Kansas State University	77	91	Rockefeller Institute	5
37	Northwestern University	74	94	University of North Dakota	4
38	California Institute of Technology	72	95	St. John's University (Jamaica, N.Y.)	3
38	St. Louis University	72	95	Union College and University	3
40	University of Pittsburgh	66	95	Bryn Mawr College	3
41	Boston University	63	95	University of New Hampshire	3
41	Washington State University	63	95	Colorado State University	3
43	Fordham University	62	95	Utah State University	3
44	University of Tennessee	58	101	Temple University	2
44	University of Missouri	58	101	University of Arkansas	2
46	University of Utah	55	101	Smith College	2
47	Massachusetts Institute of Technology	51	101	University of Mississippi	2
48	Western Reserve University	50	101	University of Delaware	2
49	University of Oklahoma	48	101	St. Bonaventure University	2
50	Catholic University of America	46	107	Adelphi College	1
51	Princeton University	45	107	Upstate Medical Center of State University of New York	1
51	Tulane University	45	107	Brandeis University	1
53	Oklahoma State University	44	107	University of Louisville	1
54	University of Colorado	43	107	University of South Carolina	1
54	University of Nebraska	43	107	College of Medical Evangelists	1
56	University of Florida	42	107	Montana State College	1
56	Syracuse University	42			

Engineering

AS MENTIONED ABOVE, the number of bachelor's degrees in engineering dropped sharply from 52,732 degrees in 1949–50 to a low of 22,236 in 1953–54 and then climbed steadily to 38,134 in 1958–59 before decreasing to 37,808 in 1959–60. (See table 1.) The percents that bachelor's degrees in engineering were of the total of all bachelor's and first professional degrees varied in the same fashion, from 12.2 in 1949–50 to 7.6 in 1953–54 and then up to 9.9 in 1958–59 before dropping again to 9.6 in 1959–60.

At the master's level the number of master's and other second-level degrees in engineering declined from 5,156 degrees in 1950–51 to 3,743 in 1952–53 and then rose steadily, reaching 7,159 in 1959–60. The corresponding percentages dropped from 8.4 in 1949–50 to 6.1 in 1952–53 and reached 9.6 in 1959–60. Hence, while engineering received a smaller share of the bachelor's and first professional degrees at the end of the decade of the fifties compared to the beginning of the decade, it received a larger share at the level of master's and other second-level degrees.

At the doctoral level, 494 degrees were received in engineering in 1949–50. For the next 7 years the annual rate was almost constant at about 600. Then in the last 3 years, 1957–58 through 1959–60, there was an upswing, reaching 786 doctorates in 1959–60. The corresponding percents decreased from 8.0 in 1950–51 to 6.6 in 1953–54 before rising again to 8.0 in 1959–60.

The decline in bachelor's degrees in engineering in 1959-60

The decline in the number of bachelor's degrees in engineering in 1959–60 compared to 1958–59 has been of concern particularly because the total number of bachelor's and first professional degrees conferred had increased. It has been surmised that many students who formerly would have been students in engineering have shifted to other sciences or mathematics. This is plausible in view of the fact that the total number of bachelor's degrees in the combined fields of biological and physical sciences, mathematics, and engineering increased from 79,707 in 1958–59 to 83,108 in 1959–60. However, it is believed that other factors, such as higher admission requirements to engineering programs at some colleges, might be involved as well.

Degrees conferred annually in various engineering specializations

Tables 7 through 10 give the annual numbers of degrees conferred at each level, in engineering curriculums accredited by the Engineers Council for Professional Developments (ECPD). Two tables are used for second-level degrees: table 8 gives master's degrees and table 9 gives predoctoral postgraduate degrees other than master's. The percentage distribution of degrees among the various curriculums for each year is also given.

The curriculums listed are those accredited by ECPD in one or more institutions. (Actually, the number of ECPD-recognized curriculums exceeds the number employed in the Office of Education-American Society for Engineering Education survey because the curriculums listed represent in some instances combinations of two or more closely related curriculums.) The number of curriculums accredited by ECPD varies from institution to institution. The number of degrees in the tables, however, includes those earned in unaccredited curriculums as well as in accredited curriculums. In 1949–50, 19 different curriculums were used on the survey form. Additional curriculums were added as they became recognized by ECPD. By 1959–60 the list of curriculums employed in the annual survey had grown to 25.

ENGINEERING: BACHELOR'S DEGREES [1]

Table 7.—Number and percent of bachelor's degrees granted in each engineering curriculum: Aggregate United States, each year 1949–50 through 1959–60

[Each curriculum listed below is accredited by the Engineer's Council for Professional Development (ECPD) at some level (usually the bachelor's) in at least one institution; numbers of degrees include those earned in nonaccredited curriculums]

[L=less than .05 percent but not zero percent; ------indicates curriculum was not included on survey form that year]

Engineering curriculum	Year ending June 30—										
	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
(Number of institutions reporting engineering degrees)	(190)	(192)	(193)	(210)	(218)	(217)	(215)	(219)	(223)	(231)	(238)
	NUMBER OF DEGREES										
Total, all curriculums	**52,732**	**41,893**	**30,286**	**24,164**	**22,236**	**22,589**	**26,396**	**31,211**	**35,332**	**38,134**	**37,618**
Aeronautical	1,553	1,271	816	645	666	686	895	1,109	1,337	1,551	1,698
Agricultural	648	650	380	333	303	268	352	401	414	493	433
Architectural	943	1,141	862	668	473	334	262	331	323	326	322
Building and construction											16
Ceramic	282	258	156	116	113	86	94	128	159	177	169
Chemical	4,529	3,756	2,859	2,276	2,042	2,027	2,466	2,818	3,008	3,131	2,966
Civil	7,772	7,060	5,354	4,400	3,955	3,868	4,227	4,683	5,134	5,394	5,287
Electrical	13,270	9,385	6,373	4,905	4,485	4,860	6,222	8,108	9,567	10,786	10,631
Engineering mechanics	14	20	20	9	6	10	7	7	9	23	34
Engineering physics	455	411	288	241	288	204	239	226	320	327	372
Engineering science										149	219
General engineering	1,501	1,031	738	602	614	660	797	838	952	909	1,000
Geological	340	308	261	217	187	182	200	227	225	243	212
Geophysical						25	20	33	27	38	39
Industrial	3,369	2,583	1,823	1,525	1,342	1,495	1,651	1,926	2,108	2,297	2,242
Mechanical	14,332	10,752	7,606	5,917	5,419	5,829	6,728	7,907	9,060	9,592	9,597
Metallurgical	961	802	581	550	495	449	485	577	670	724	682
Mining	483	493	412	304	254	204	213	231	240	239	242
Naval architecture and marine	100	128	343	155	299	244	309	291	263	289	295
Nuclear											53
Petroleum	989	893	661	565	481	467	522	650	688	731	599
Sanitary	49	76	32	15	13	13	15	10	4	10	9
Textile	289	154	193	169	171	151	130	124	132	108	77
Welding										5	10
Others	853	721	528	552	696	527	452	584	672	592	614
	PERCENT OF DEGREES										
Total, all curriculums	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Aeronautical	2.9	3.0	2.7	2.7	3.0	3.0	3.4	3.6	3.8	4.1	4.5
Agricultural	1.2	1.5	1.2	1.4	1.4	1.2	1.3	1.3	1.2	1.3	1.1
Architectural	1.8	2.7	2.8	2.8	2.1	1.5	1.0	1.0	0.9	0.9	0.9
Building and construction											L
Ceramic	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4
Chemical	8.6	9.0	9.4	9.4	9.2	9.0	9.4	9.0	8.6	8.2	7.8
Civil	14.7	16.8	17.7	18.2	17.8	17.2	16.9	15.0	14.6	14.1	14.0
Electrical	25.2	22.4	21.0	20.3	20.2	21.5	23.6	26.0	27.2	28.2	28.1
Engineering mechanics	L	0.1	0.1	L	L	L	L	L	L	0.1	0.1
Engineering physics	0.9	1.0	0.9	1.0	1.0	0.9	1.0	0.7	0.9	0.9	1.0
Engineering science										0.4	0.6
General engineering	2.8	2.5	2.4	2.5	2.8	2.9	3.0	2.7	2.7	2.4	2.6
Geological	0.6	0.7	0.9	0.9	0.8	0.8	0.8	0.7	0.6	0.6	0.6
Geophysical						0.1	0.1	0.1	0.1	0.1	0.1
Industrial	6.4	6.2	6.0	6.3	6.0	6.6	6.3	6.2	6.0	6.8	5.9
Mechanical	27.2	25.7	25.1	24.5	24.4	25.8	25.6	25.5	25.7	25.2	25.4
Metallurgical	1.8	1.9	1.9	2.3	2.2	2.0	1.8	1.8	1.9	1.9	1.8
Mining	0.9	1.2	1.4	1.3	1.1	0.9	0.8	0.7	0.7	0.6	0.6
Naval architecture and marine	0.2	0.3	1.1	0.6	1.3	1.1	1.2	0.9	0.7	0.7	0.8
Nuclear											0.1
Petroleum	1.9	2.1	2.2	2.3	2.2	2.1	2.0	2.1	2.0	1.9	1.6
Sanitary	0.1	0.2	0.1	0.1	0.1	0.1	0.1	L	L	L	L
Textile	0.6	0.4	0.6	0.7	0.8	0.7	0.5	0.4	0.4	0.3	0.2
Welding										L	L
Others	1.6	1.7	1.7	2.3	3.1	2.3	1.7	1.9	1.9	1.6	1.6

[1] For a complete report on engineering degrees and enrollments refer to the annual series of reports on *Engineering Enrollments and Degrees* published by the Office of Education.

ENGINEERING: MASTER'S DEGREES[1]

Table 8.—Number and percent of master's degrees granted in each engineering curriculum: Aggregate United States, each year 1949–50 through 1959–60

[Each curriculum listed below is accredited by the Egnineer's Council for Professional Development (ECPD) at some level (usually the bachelor's) in at least one institution; numbers of degrees include those earned in nonaccredited curriculums]

[L=less than .05 percent but not zero percent; .... indicates curriculum was not included on survey form that year]

Engineering curriculum	Year ending June 30—										
	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
(Number of institutions reporting engineering degrees)	(108)	(115)	(117)	(113)	(122)	(127)	(130)	(134)	(144)	(144)	(149)
	NUMBER OF DEGREES										
Total, all curriculums	**4,754**	**5,831**	**4,914**	**3,635**	**4,078**	**4,379**	**4,589**	**5,093**	**5,669**	**6,615**	**6,989**
Aeronautical	305	294	221	190	199	182	198	243	292	315	330
Agricultural	42	67	72	50	50	70	64	73	58	90	105
Architectural	14	23	17	5	12	14	10	12	16	8	13
Building and construction	....	....	....	....	....	....	....	....	....	....	12
Ceramic	54	55	36	24	34	19	29	28	25	32	30
Chemical	700	742	540	433	445	456	543	586	554	591	610
Civil	709	658	571	560	560	683	806	836	795	919	1,003
Electrical	1,137	1,158	991	866	960	1,059	1,133	1,272	1,536	1,803	1,945
Engineering mechanics	69	88	59	51	44	74	63	71	111	127	187
Engineering physics	66	73	90	71	74	42	48	44	29	45	46
Engineering science	....	....	....	....	....	....	....	....	....	63	99
General engineering	23	32	54	25	64	86	56	76	116	147	159
Geological	20	31	17	33	9	20	8	19	12	17	16
Geophysical	....	....	....	....	....	6	6	2	6	4	8
Industrial	246	271	265	215	375	374	352	393	486	577	468
Mechanical	821	927	633	608	711	747	744	799	936	1,059	1,154
Metallurgical	180	236	134	123	136	146	133	134	178	199	203
Mining	32	44	30	19	22	24	24	22	20	27	35
Naval architecture and marine	10	11	6	8	20	16	10	41	38	50	53
Nuclear	....	....	....	....	....	....	....	....	....	....	157
Petroleum	72	66	74	31	65	64	66	87	74	96	66
Sanitary	71	68	56	50	68	73	60	80	43	73	85
Textile	12	11	10	14	11	14	17	18	21	16	12
Transportation	....	....	....	....	....	....	....	....	....	....	15
Welding	....	....	....	....	....	....	....	....	....	0	2
Others	171	176	138	259	219	210	219	257	323	355	176
	PERCENT OF DEGREES										
Total, all curriculums	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Aeronautical	6.4	5.8	5.5	5.2	4.9	4.2	4.3	4.8	5.2	4.8	4.7
Agricultural	0.9	1.3	1.8	1.4	1.2	1.6	1.4	1.4	1.0	1.3	1.5
Architectural	0.3	0.5	0.4	0.1	0.3	0.3	0.2	0.2	0.3	0.1	0.2
Building and construction	....	....	....	....	....	....	....	....	....	....	0.2
Ceramic	1.1	1.1	0.9	0.7	0.8	0.4	0.6	0.5	0.4	0.5	0.4
Chemical	14.7	14.8	13.5	11.9	10.9	10.4	11.8	11.5	9.8	8.9	8.7
Civil	14.9	13.1	14.2	15.4	13.7	15.6	17.6	16.4	14.1	13.9	14.4
Electrical	23.9	23.0	24.7	23.8	23.5	24.2	24.7	25.0	27.7	27.2	27.8
Engineering mechanics	1.5	1.8	1.8	1.4	10.8	1.7	1.4	1.4	2.0	1.9	2.7
Engineering physics	1.4	1.5	2.2	2.0	1.8	1.0	1.1	0.9	0.5	0.7	0.7
Engineering science	....	....	....	....	....	....	....	....	....	0.9	1.4
General engineering	0.5	0.6	1.4	0.7	1.6	2.0	1.2	1.5	2.1	2.2	2.3
Geological	0.4	0.6	0.4	0.9	0.2	0.5	0.2	0.4	0.2	0.3	0.2
Geophysical	....	....	....	....	....	0.1	0.1	L	0.1	0.1	0.1
Industrial	5.2	5.4	6.6	5.9	9.2	8.5	7.7	7.7	8.6	8.7	6.7
Mechanical	17.3	18.4	15.8	16.7	17.4	17.1	16.2	15.8	16.5	16.0	16.5
Metallurgical	3.8	4.7	3.3	3.4	3.3	3.3	2.9	2.6	3.1	3.0	2.9
Mining	0.7	0.9	0.8	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.5
Naval architecture and marine	0.2	0.2	0.2	0.2	0.5	0.4	0.2	0.8	0.7	0.8	0.8
Nuclear	....	....	....	....	....	....	....	....	....	....	2.2
Petroleum	1.5	1.3	1.8	0.9	1.6	1.5	1.4	1.7	1.3	1.4	0.9
Sanitary	1.5	1.4	1.4	1.4	1.7	1.7	1.3	1.6	0.8	1.1	1.2
Textile	0.3	0.2	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.2	0.2
Transportation	....	....	....	....	....	....	....	....	....	....	0.2
Welding	....	....	....	....	....	....	....	....	....	0.0	L
Others	3.6	3.5	3.4	7.1	5.4	4.8	4.8	5.0	5.7	5.4	2.5

[1] For a complete report on engineering degrees and enrollments refer to the annual series of reports on *Engineering Enrollments and Degrees* published by the Office of Education.

ENGINEERING: OTHER POSTGRADUATE, PREDOCTORAL DEGREES [1]

Table 9.—Number and percent of other postgraduate, predoctoral degrees granted in each engineering curriculum: Aggregate United States, each year 1949–50 through 1959–60

[Each curriculum listed below is accredited by the Engineer's Council for Professional Development (ECPD) at some level (usually the bachelor's) in at least one institution; numbers of degrees include those earned in nonaccredited curriculums]

[---- indicates curriculum was not included on survey form that year]

Engineering curriculum	Year ending June 30—										
	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
(Number of institutions reporting engineering degrees)	(16)	(13)	(12)	(13)	(10)	(11)	(25)	(15)	(18)	(15)	(16)
	Number of Degrees										
Total, all curriculums	**150**	**125**	**127**	**108**	**99**	**105**	**135**	**139**	**119**	**138**	**170**
Aeronautical	21	19	18	21	20	22	18	14	9	16	12
Agricultural	0	0	0	3	0	0	0	0	0	0	0
Architectural	0	0	0	0	0	0	0	0	0	0	0
Building and construction	----	----	----	----	----	----	----	----	----	----	1
Ceramic	0	1	0	0	0	0	1	1	1	1	0
Chemical	12	2	0	0	3	14	2	16	7	5	7
Civil	20	6	15	13	5	10	16	14	15	7	21
Electrical	31	34	26	14	18	15	28	40	34	43	48
Engineering mechanics	1	0	0	1	0	2	0	1	2	2	3
Engineering physics	0	0	0	3	4	0	1	0	0	0	0
General engineering	0	0	0	0	0	0	0	0	0	0	4
Geological	0	0	0	0	0	0	0	1	1	2	2
Geophysical	----	----	----	----	----	0	0	0	0	0	0
Industrial	12	2	6	7	0	0	2	2	0	1	0
Mechanical	14	20	18	19	12	11	21	13	16	22	25
Metallurgical	4	2	2	3	3	0	6	6	5	6	7
Mining	4	1	0	3	0	0	5	5	4	5	6
Naval architecture and marine	27	34	38	19	29	27	31	26	24	27	32
Petroleum	1	1	0	1	0	0	0	0	0	0	0
Sanitary	1	1	2	1	3	2	2	0	1	1	0
Textile	0	0	0	0	0	0	0	0	0	0	0
Others	2	2	2	0	2	2	2	0	0	0	2
	Percent of Degrees										
Total, all curriculums	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Aeronautical	14.0	15.2	14.2	19.4	20.2	21.0	13.4	10.1	7.5	11.6	7.1
Agricultural	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Architectural	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building and construction	----	----	----	----	----	----	----	----	----	----	0.6
Ceramic	0.0	0.8	0.0	0.0	0.0	0.0	0.7	0.7	0.8	0.7	0.0
Chemical	8.0	1.6	0.0	0.0	3.0	13.3	1.5	11.5	5.7	3.6	4.1
Civil	13.3	4.8	11.8	12.0	5.0	9.5	11.8	10.1	12.5	5.1	12.4
Electrical	20.7	27.2	20.5	13.0	18.2	14.3	20.8	28.8	28.5	31.1	28.2
Engineering mechanics	0.7	0.0	0.0	0.9	0.0	1.9	0.0	0.7	1.7	1.3	1.7
Engineering physics	0.0	0.0	0.0	2.8	4.0	0.0	0.7	0.0	0.0	0.0	0.0
General engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4
Geological	0.0	0.0	0.0	0.0	0.0	0.0	0 0	0.7	0.8	1.3	1.2
Geophysical	----	----	----	----	----	0.0	0.0	0.0	0.0	0.0	0.0
Industrial	8.0	1.6	4.7	6.5	0.0	0.0	1.5	1.4	0.0	1.3	0.0
Mechanical	9.3	16.0	14.2	17.6	12.0	14.5	15.5	9.4	13.4	15.9	14.7
Metallurgical	2.7	1.6	1.6	2.8	3.0	0.0	4.4	4.3	4.3	9.3	4.1
Mining	2.7	0.8	0.0	2.8	0.0	0.0	3.7	3.6	3.4	3.6	3.5
Naval architecture and marine	18.0	27.2	30.0	17.6	29.3	25.7	23.0	18.7	20.1	19.6	18.8
Petroleum	0.7	0.8	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sanitary	0.7	0.8	1.6	0.9	3.0	1.9	1.5	0.0	0.8	1.3	0.0
Textile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	1.3	1.6	1.6	0.0	2.0	1.9	1.5	0.0	0.0	0.0	1.2

[1] For a complete report on engineering degrees and enrollments refer to the annual series of reports on *Engineering Enrollments and Degrees* published by the Office of Education.

ENGINEERING: DOCTOR'S DEGREES[1]

Table 10.—Number and percent of doctor's degrees granted in each engineering curriculum: Aggregate United States, each year 1949–50 through 1959–60

[Each curriculum listed below is accredited by the Engineer's Council for Professional Development (ECPD) at some level (usually the bachelor's) in at least one institution; numbers of degrees include those earned in nonaccredited curriculums]

[------indicates curriculum was not included on survey form that year]

Engineering curriculum	Year ending June 30—										
	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
(Number of institutions reporting engineering degrees)	(47)	(56)	(55)	(57)	(55)	(54)	(55)	(61)	(64)	(59)	(69)
	NUMBER OF DEGREES										
Total, all curriculums	**494**	**586**	**586**	**592**	**590**	**599**	**610**	**596**	**647**	**714**	**786**
Aeronautical	25	31	24	29	43	23	36	32	26	24	23
Agricultural	2	5	5	5	7	7	9	13	10	14	17
Architectural	0	0	0	0	0	0	0	0	0	0	0
Ceramic	14	8	8	7	16	16	14	14	11	8	12
Chemical	178	174	159	147	133	139	136	146	127	143	170
Civil	32	51	43	32	43	29	59	39	69	70	73
Electrical	85	110	121	132	111	141	136	130	144	189	203
Engineering mechanics	13	17	25	24	25	22	16	15	43	42	28
Engineering physics	1	24	29	26	18	14	17	17	9	7	8
Engineering science	------	------	------	------	------	------	------	------	------	3	12
General engineering	3	3	5	4	8	16	2	9	9	7	10
Geological	0	3	4	8	2	0	1	1	2	1	0
Geophysical	------	------	------	------	------	1	1	0	1	0	0
Industrial	3	5	6	3	6	9	10	17	9	12	13
Mechanical	48	70	68	78	72	79	61	67	76	83	107
Metallurgical	46	40	53	56	53	62	72	53	63	63	65
Mining	1	2	3	1	3	2	3	0	2	2	3
Naval architecture and marine	0	1	0	0	0	0	0	2	0	1	2
Nuclear	------	------	------	------	------	------	------	------	------	------	15
Petroleum	2	2	3	4	6	5	4	4	4	2	4
Sanitary	2	4	7	4	6	6	8	8	7	6	6
Textile	1	0	0	2	0	0	0	0	0	0	0
Transportation	------	------	------	------	------	------	------	------	------	------	1
Others	38	36	23	30	38	28	25	29	35	37	14
	PERCENT OF DEGREES										
Total, all curriculums	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Aeronautical	5.1	5.3	4.1	4.9	7.3	3.8	5.9	5.4	4.0	3.4	2.9
Agricultural	0.4	0.8	0.8	0.8	1.2	1.2	1.5	2.2	1.5	2.0	2.2
Architectural	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ceramic	2.8	1.4	1.4	1.2	2.7	2.7	2.3	2.3	1.7	1.1	1.5
Chemical	36.0	29.7	27.1	24.8	22.5	23.2	22.3	24.5	19.7	19.8	21.7
Civil	6.5	8.7	7.3	5.4	7.3	4.8	9.7	6.5	10.7	9.8	9.3
Electrical	17.2	18.8	20.6	22.3	18.8	23.5	22.3	21.8	22.4	26.4	25.9
Engineering mechanics	2.6	2.4	4.3	4.0	4.2	3.7	2.6	2.5	6.7	5.9	3.6
Engineering physics	0.2	4.1	5.0	4.4	3.0	2.3	2.7	2.9	1.4	1.0	1.0
Engineering science	------	------	------	------	------	------	------	------	------	0.4	1.5
General engineering	0.6	0.5	0.9	0.7	1.4	2.7	0.3	1.5	1.4	1.0	1.3
Geological	0.0	0.5	0.7	1.4	0.3	0.0	0.2	0.2	0.3	0.1	0.0
Geophysical	------	------	------	------	------	0.2	0.2	0.0	0.2	0.0	0.0
Industrial	0.6	0.8	1.0	0.5	1.0	1.5	1.6	2.9	1.4	1.7	1.7
Mechanical	9.7	12.0	11.6	13.2	12.2	13.2	10.0	11.2	1.7	11.6	13.7
Metallurgical	9.3	6.8	9.0	9.5	9.0	10.4	11.8	8.9	9.8	8.8	8.3
Mining	0.2	0.1	0.5	0.2	0.5	0.3	0.5	0.0	0.3	0.3	0.4
Naval architecture and marine	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.3
Nuclear	------	------	------	------	------	------	------	------	------	------	1.9
Petroleum	0.4	0.3	0.5	0.7	1.0	0.8	0.7	0.7	0.6	0.3	0.5
Sanitary	0.4	0.7	1.2	0.7	1.0	1.0	1.3	1.3	1.1	0.8	0.8
Textile	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation	------	------	------	------	------	------	------	------	------	------	0.1
Others	7.7	6.1	3.9	5.1	6.4	4.7	4.1	4.9	5.4	5.2	1.8

[1] For a complete report on engineering degrees and enrollments refer to the annual series of reports on *Engineering Enrollments and Degrees* published by the Office of Education.

Bachelor's degrees conferred in the four largest fields of engineering

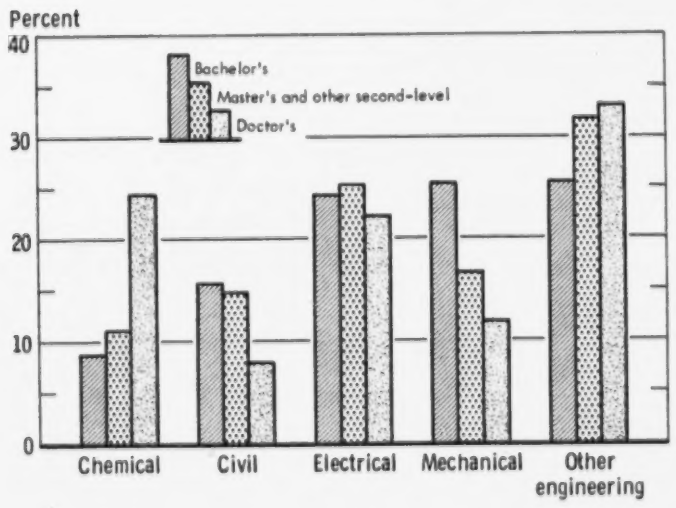
Figure 2 shows how degrees in engineering for the entire period 1949–50 through 1959–60 were distributed among the four major specializations in engineering: chemical, civil, electrical, and mechanical. More degrees during the 11-year period were awarded at bachelor's level in mechanical engineering than in any other specialization, electrical engineering being a close second. However, whereas mechanical engineering led in the number of bachelor's degrees for each year from 1949–50 through 1955–56, electrical engineering led for each year from 1956–57 through 1959–60. During the early years of the decade approximately one-fifth of the bachelor's degrees in engineering were conferred in electrical engineering. This proportion has been increasing, however, and in 1959–60 more than one-fourth of the bachelor's degrees in engineering were conferred in electrical engineering.

Civil engineering has consistently been the third largest field in which bachelor's degrees in engineering have been conferred from 1949–50 through 1959–60. The annual proportion of degrees conferred in this field has been fluctuating between one-seventh and one-sixth of the total with no indication that the proportion of degrees conferred in civil engineering will become larger or smaller.

Chemical engineering has been the fourth largest field in which bachelor's degrees in engineering have been conferred from 1949–50 through 1959–60. In the early 1950's nearly one-tenth of the bachelor's degrees in engineering were conferred in this field. In recent years this proportion has been decreasing slightly. During 1959–60, approximately one-thirteenth of the bachelor's degrees conferred in engineering were in chemical engineering.

Each year from 1949–50 through 1959–60 approximately three-fourths of all bachelor's degrees in engineering have been conferred in the combined fields of electrical, mechanical, civil and chemical engineering.

Figure 2.—Percentage distribution of degrees within engineering: Aggregate United States, 1949–50 through 1959–60



Master's degrees conferred in the four largest fields of engineering

In contrast to the foregoing data presented on bachelor's degrees in engineering, more master's degrees have been conferred annually in electrical engineering from 1949–50 through 1959–60 than in any other field. In the early 1950's somewhat less than one-fourth of all master's degrees in engineering were conferred in electrical engineering. Beginning with 1954–55 the proportion of master's-level degrees conferred in this field has been increasing slightly from year to year. Data reported for 1959–60 showed 27.8 percent in electrical engineering.

From 1949–50 through 1959–60 mechanical engineering was generally the second largest field in which master's degrees were conferred in engineering. During each of these years approximately one-sixth of the master's degrees in engineering were conferred in this field. There is no definite indication that this proportion is changing.

Civil engineering, the third largest field from 1951–52 through 1959–60, consistently accounted for approximately one-seventh of the annual number of master's degrees in engineering, while chemical engineering was the fourth largest field during this period. Unlike the three fields previously mentioned, the proportion of degrees conferred in this field has decreased. During 1949–50, 14.7 percent of the master's degrees conferred in engineering were in chemical engineering, and by the end of the 1959–60 year this proportion had decreased to 8.7 percent.

Each year from 1949–50 through 1959–60 slightly more than two-thirds of the master's degrees in engineering were conferred in the combined fields of electrical, mechanical, civil, and chemical engineering.

Doctor's degrees conferred in the five largest fields of engineering

For most of the years from 1949–50 through 1956–57, chemical engineering was the largest major field in which doctor's degrees were conferred in engineering, with electrical engineering a close second. In 1957–58, electrical engineering became the largest field and has retained that position each succeeding year. During 1959–60, electrical engineering accounted for 25.9 percent of the doctor's degrees conferred in engineering, chemical engineering for 21.7 percent, mechanical engineering for 13.7 percent, civil engineering for 9.3 percent, and metallurgical engineering for 8.3 percent. These five fields made up 78.9 percent of the doctor's degrees conferred in engineering during 1959–60. On the average these five fields accounted for approximately three-fourths of the annual number of doctor's degrees conferred in engineering from 1949–50 through 1959–60.

Doctorate production in engineering, by institution

Table 11 gives the number of doctorates in engineering awarded at individual institutions for the 10-year period 1949–50 through 1958–59. No breakdown by specialization is given.

ENGINEERING

Table 11.—Rank order of institutions with respect to total number of doctorates in *engineering* granted during 1949–50 through 1958–59: Aggregate United States

Rank order	Institution	10-year total	Rank order	Institution	10-year total
1	Massachusetts Institute of Technology	686	37	University of Washington	36
2	University of Illinois	362	38	University of Cincinnati	35
3	University of Michigan	328	38	University of Missouri (all campuses)	35
4	Purdue University	324	40	Agricultural and Mechanical College of Texas	33
5	Stanford University	243	41	Virginia Polytechnic Institute	32
6	Ohio State University	242	42	University of North Carolina, State College	29
7	University of Wisconsin	226	43	Syracuse University	26
8	California Institute of Technology	213	44	University of Maryland	25
9	University of California (all campuses)	207	45	University of Colorado	20
10	Harvard University	201	45	Oklahoma State University	20
11	Carnegie Institute of Technology	179	47	Louisiana State University	19
12	Cornell University	165	47	West Virginia University	19
13	Columbia University	155	49	University of Florida	16
14	University of Minnesota	138	50	Brown University	13
15	Northwestern University	130	50	University of Tennessee	13
16	Iowa State University of Science and Technology	128	52	Oregon State University	12
17	Polytechnic Institute of Brooklyn	127	53	University of Southern California	9
18	Pennsylvania State University	124	53	University of Notre Dame	9
19	Yale University	117	55	Montana State College	8
20	Johns Hopkins University	110	55	Rutgers, The State University	8
21	Illinois Institute of Technology	108	57	Colorado State University	7
22	University of Texas	98	57	University of Kansas	7
23	Case Institute of Technology	86	57	University of Oklahoma	7
24	State University of Iowa	73	57	Utah State University	7
25	Princeton University	69	61	University of Kentucky	5
26	Michigan State University	68	61	Rice University	5
27	Rensselaer Polytechnic Institute	66	63	University of Rochester	4
28	New York University	65	63	Catholic University of America	4
28	Lehigh University	65	65	Kansas State University	3
30	University of Pennsylvania	60	65	Stevens Institute of Technology	3
31	University of Delaware	52	65	Alfred University	3
32	Colorado School of Mines	45	68	St. Louis University	2
33	Washington University	44	68	University of North Dakota	2
34	University of Utah	43	70	U.S. Naval Postgraduate School	1
35	Georgia Institute of Technology	40			
36	University of Pittsburgh	37			

The institutions are ranked according to the number of doctorates in engineering they awarded. Seventy institutions gave one or more doctorates during the 10-year period. The Massachusetts Institute of Technology heads the list with 686 doctorates, followed by the University of Illinois with 362, the University of Michigan with 328, and Purdue University with 324. The first 10 institutions gave more doctorates than did the remaining 60 institutions.

The Mathematical Subjects

THE MOST rapidly growing of all of the major disciplines in the later 1950's was mathematics (including statistics and actuarial science). The number of bachelor's degrees increased from 4,034 to 11,437, the number of master's degrees from 761 to 1,765, and the number of doctor's degrees from 250 to 303 during the period 1954–55 to 1959–60. (See table12.) The percentages that mathematics degrees at each level were of the total at each level has also greatly increased.

Degrees in statistics were not counted separately from mathematics until 1955–56. It is seen from table 12 that the numbers of formal degrees in statistics are relatively small, although it is true that many degrees awarded as mathematics degrees have strong concentration in statistics. Data are not collected separately for actuarial science, a small field comparatively.

Totals for the 11-year period

For the entire 11-year period 1949–50 through 1959–60 the 66,978 degrees in mathematics and statistics constituted 1.8 percent of the total number of bachelor's and first professional degrees; the 11,390 master's degrees, 1.6 percent of total number of master's and other second-level degrees; and the 2,584 doctorates, 2.8 of the total number of earned doctorates. During this period women received 28.4 percent of the bachelor's degrees in the mathematical subjects, 18.8 percent of the master's and 5.4 percent of the doctorates. At the bachelor's level mathematics is relatively more popular among women than any of the sciences. The percent of 28.4 is only slightly less than the 32.6 for women on the basis of degrees in all disciplines. The percents drop sharply, however, at each higher level, showing that fewer women than men proportionately go on to higher degrees in mathematics. The high percentage of women who plan to teach mathematics at the secondary school likely accounts for the rather high percentage at the bachelor's level.

Number of institutions conferring degrees in mathematics and statistics

The number of institutions that conferred one or more bachelor's degrees in mathematics increased from 751 in 1954–55 to 904 in 1959–60. At the master's level over the same years the number of institutions increased from 146 to 207 and at the doctorate level, from 58 to 64. Only a few institutions give formal degrees in statistics. In 1959–60 there were 25 institutions that gave one or more such degrees at the bachelor's level, 26 institutions at the master's level, and 14 institutions at the doctor's level.

Doctorate production in mathematics and statistics, by institution

Table 13 shows the total number of doctorates awarded by individual institutions for the 10-year period, 1949–50 through 1958–59. The 75 different institutions which awarded the degrees are ranked in decreasing order of the total number each institution awarded during the 10-year period. The first 13 institutions granted more degrees than did the remaining 62. The University of California (all campuses) heads the list with 170, followed by New York University with 120, and Princeton University with 114.

MATHEMATICS AND STATISTICS

Table 12.—Number and percent of degrees in *mathematics and statistics*, by level and sex: Aggregate United States, each year 1949–50 through 1959–60

[N.A. means data not available]

Year ending June 30	Number of degrees conferred in mathematics [1]	Number of degrees conferred in statistics [2] (not counted separately until 1956)	Mathematics and statistics as a percent of degrees in all fields awarded at given level [3]	Number of mathematics and statistics degrees awarded to men	Number of mathematics and statistics degrees awarded to women	Percent of mathematics and statistics degrees awarded to women	Number of institutions that conferred degrees in mathematics [4]	Number of institutions that conferred degrees in statistics [4]
	Bachelor's Level							
1950	6, 392	N.A.	1. 47	4, 946	1, 446	22. 6	(*)	N.A.
1951	5, 753	N.A.	1. 49	4, 311	1, 442	25. 1	(*)	N.A.
1952	4, 721	N.A.	1. 42	3, 389	1, 332	28. 2	(*)	N.A.
1953	4, 396	N.A.	1. 44	3, 122	1, 274	29. 0	(*)	N.A.
1954	4, 090	N.A.	1. 40	2, 722	1, 368	33. 4	(*)	N.A.
1955	4, 034	N.A.	1. 40	2, 724	1, 310	32. 5	751	N.A.
1956	4, 600	60	1. 50	3, 137	1, 523	32. 7	753	17
1957	5, 491	55	1. 63	3, 826	1, 720	31. 0	781	19
1958	6, 835	89	1. 89	4, 953	1, 971	28. 5	826	22
1959	8, 955	64	2. 34	6, 504	2, 515	27. 9	871	21
1960	11, 361	76	2. 90	8, 312	3, 125	27. 3	904	25
	Master's and Other Second-Level							
1950	974	N.A.	1. 67	784	190	19. 5	(*)	N.A.
1951	1, 109	N.A.	1. 70	929	180	16. 2	(*)	N.A.
1952	802	N.A.	1. 26	663	139	17. 3	(*)	N.A.
1953	677	N.A.	1. 10	565	112	16. 5	(*)	N.A.
1954	706	N.A.	1. 24	579	127	21. 0	(*)	N.A.
1955	761	N.A.	1. 31	613	148	19. 4	146	N.A.
1956	824	74	1. 51	719	179	19. 9	145	21
1957	899	66	1. 56	777	188	19. 5	152	20
1958	1, 097	137	1. 88	994	240	19. 4	168	25
1959	1, 378	121	2. 16	1, 188	311	20. 7	177	25
1960	1, 652	113	2. 37	1, 428	337	19. 1	207	26
	Doctor's Level							
1950	160	N.A.	2. 41	151	9	5. 6	(*)	N.A.
1951	184	N.A.	2. 51	175	9	4. 9	(*)	N.A.
1952	206	N.A.	2. 68	195	11	5. 3	(*)	N.A.
1953	241	N.A.	2. 90	227	14	5. 8	(*)	N.A.
1954	227	N.A.	2. 52	213	14	6. 2	(*)	N.A.
1955	250	N.A.	2. 83	239	11	4. 4	58	N.A.
1956	200	35	2. 64	225	10	4. 3	54	10
1957	222	27	2. 84	236	13	5. 2	55	10
1958	210	37	2. 76	232	15	6. 1	57	12
1959	255	27	3. 01	267	15	5. 3	61	10
1960	259	44	3. 08	285	18	5. 9	64	14

[1] Includes statistics until 1956.

[2] Includes actuarial science.

[3] For example, the percent at the bachelor's level is based upon all bachelor's and first-professional degrees conferred that year.

[4] Counting of the number of institutions that conferred degrees in separate disciplines was not begun until 1955 (in statistics, 1956).

*Data not readily ascertainable.

MATHEMATICS AND STATISTICS

Table 13.—Rank order of institutions with respect to total number of doctorates in *mathematics and statistics* granted during 1949–50 through 1958–59: Aggregate United States

Rank order	Institution	10-year total	Rank order	Institution	10-year total
1	University of California (all campuses)	170	36	Virginia Polytechnic Institute	18
2	New York University	120	39	University of Notre Dame	16
3	Princeton University	114	39	University of Kentucky	16
4	University of Chicago	101	39	University of Tennessee	16
4	University of Michigan	101	39	George Washington University	16
6	University of Illinois	92	43	Rice University	15
7	Columbia University	82	43	Catholic University of America	15
8	Harvard University	71	45	Illinois Institute of Technology	14
8	Massachusetts Institute of Technology	71	45	Northwestern University	14
10	Brown University	70	47	University of Georgia	13
11	University of North Carolina, Chapel Hill	68	48	University of Missouri	12
12	University of Wisconsin	57	48	University of Southern California	12
13	Iowa State University	55	48	University of Oklahoma	12
14	Purdue University	54	48	Oregon State College	12
15	Yale University	50	52	George Peabody College for Teachers	11
16	University of Minnesota	48	52	University of Virginia	11
17	Stanford University	47	54	University of Colorado	10
18	University of Pittsburgh	43	55	Boston University	9
18	University of Texas	43	55	University of Cincinnati	9
20	Carnegie Institute of Technology	40	55	Washington University	9
21	University of Florida	34	58	University of Buffalo	8
21	University of Pennsylvania	34	59	Louisiana State University	7
23	University of Washington	33	59	Johns Hopkins University	7
24	California Institute of Technology	32	59	University of Rochester	7
25	University of North Carolina, State College	31	59	Case Institute of Technology	7
26	Indiana University	29	63	Auburn University	6
26	Ohio State University	29	63	Oklahoma State University	6
28	Cornell University	26	63	Pennsylvania State University	6
29	Duke University	24	63	Vanderbilt University	6
30	Tulane University	23	67	Rutgers, The State University	5
30	University of Oregon	23	67	Lehigh University	5
32	University of Maryland	22	69	University of Utah	4
33	State University of Iowa	21	69	American University	4
34	University of Kansas	19	71	Wayne State University	3
34	Michigan State University	19	71	University of Nebraska	3
36	St. Louis University	18	71	Radcliffe College	3
36	Syracuse University	18	74	Rensselaer Polytechnic Institute	1
			74	Bryn Mawr College	1

The Physical Sciences

THE NUMBER of bachelor's degrees in the physical sciences decreased from 19,653 in 1949–50 to 10,993 in 1953–54 and then rose steadily to 17,133 by 1959–60. (See table 1.) The percentages that bachelor's degrees in the physical sciences were of the total of all bachelor's and first professional degrees decreased from 4.5 in 1949–50 to 3.7 in 1952–53 and then rose to 4.3 in 1958–59 and in 1959–60.

After a decrease from 3,317 master's degrees in 1950–51 to 2,421 degrees in 1953–54, the annual number of master's degrees in the physical sciences increased and reached 3,584 in 1959–60. The percentages that master's degrees in physical sciences were of the total of all master's and second-level degrees varied in similar fashion, with a drop from 5.7 in 1949–50 to 4.3 in 1953–54 followed by a rise to 4.8 for the last three years of the period covered by this study.

After a rise from 1,473 doctorates in 1949–50 to 1,652 in 1950–51, the number of doctorates varied very little the next 8 years. Then a significant increase raised the number to 1,815 in 1958–59. There were 1,839 such doctorates awarded in 1959–60. The corresponding percentages that doctorates in the physical sciences were of the total of all doctorates declined, though somewhat erratically, from 22.2 percent in 1949–50 to 18.7 percent in 1959–60.

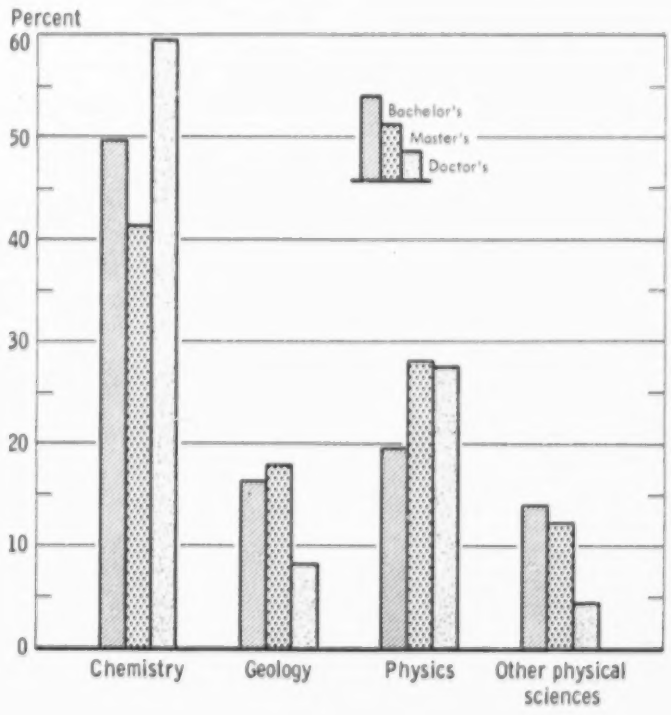
Distribution of the physical sciences among selected specializations for the 11-year period

Figure 3 shows, for each level, the percentages that chemistry, geology, and physics were of the total number of physical science degrees granted during the period covered by this study. Chemistry accounted for almost half of bachelor's degrees, a little over 40 percent of the master's degrees, and almost 60 percent of the doctorates. Physics was the next largest discipline with almost 20 percent of the bachelor's degrees and between 25 and 30 percent of master's or doctor's degrees. Geology received between 15 and 20 percent of the bachelor's and master's degrees but less than 10 percent of the doctorates. The total numbers of degrees earned during the 11-year period in the disciplines of astronomy, chemistry, geology, meteorology, and physics are shown in table 2.

Doctorate production in the physical sciences, by institution

Table 14 gives the number of doctorates in the physical sciences awarded at individual institutions for the 10-year period 1949–50 through 1958–59. Doctorate production during this period in astronomy, chemistry, geology, meteorology, and physics appears in the following sections which deal with these disciplines.

Figure 3.—Percentage distribution of degrees within the physical sciences; Aggregate United States, 1949–50 through 1959–60



There were 109 institutions that conferred at least one doctorate in the physical sciences during the 10-year period. They are ranked in decreasing order of the number of such degrees each institution granted. The University of California (all campuses) heads the list with 1,085 followed by the Massachusetts Institute of Technology with 819 and the University of Illinois with 807.

PHYSICAL SCIENCES

Table 14.—Rank order of institutions with respect to total number of doctorates in *physical sciences* granted during 1949–50 through 1958–59: Aggregate United States

Rank order	Institution	10-year total	Rank order	Institution	10-year total
1	University of California (all campuses)	1,085	57	Vanderbilt University	89
2	Massachusetts Institute of Technology	819	58	Louisiana State University	82
3	University of Illinois	807	59	University of Cincinnati	81
4	Columbia University	598	60	Rensselaer Polytechnic Institute	80
5	University of Wisconsin	574	61	University of Oklahoma	78
6	Ohio State University	532	62	Lehigh University	76
7	Harvard University	498	63	Syracuse University	75
8	University of Chicago	447	64	Lawrence College (Institute of Paper Chemistry)	70
9	Yale University	415	65	University of Nebraska	69
10	Purdue University	407	66	Case Institute of Technology	63
11	Cornell University	373	67	University of Connecticut	61
12	University of Michigan	359	68	Boston University	58
13	Pennsylvania State University	349	68	University of Buffalo	58
14	Iowa State University	341	70	Kansas State University	53
15	Princeton University	328	71	Washington State University	52
16	University of Texas	323	72	Tulane University	51
17	California Institute of Technology	317	73	Temple University	50
18	University of Minnesota	316	74	Florida State University	49
19	New York University	294	75	Agricultural and Mechanical College of Texas	48
20	Stanford University	281	76	University of Kentucky	43
21	University of Washington	258	77	Emory University	38
22	Northwestern University	253	77	University of New Mexico	38
23	Polytechnic Institute of Brooklyn	244	77	Oklahoma State University	38
24	University of Notre Dame	226	80	University of Oregon	35
24	University of Pennsylvania	226	81	Clark University	29
26	Johns Hopkins University	214	82	Radcliffe College	27
27	University of Rochester	209	82	University of Louisville	27
28	Indiana University	202	84	Georgia Institute of Technology	26
29	Carnegie Institute of Technology	198	85	University of Arizona	23
30	Iowa State University	191	85	West Virginia University	23
31	Michigan State University	168	87	University of Alabama	22
32	University of Pittsburgh	165	88	Virginia Polytechnic Institute	16
33	University of Maryland	160	89	University of Massachusetts	15
33	Duke University	160	89	Bryn Mawr College	15
35	Brown University	152	89	University of Wyoming	15
35	University of Utah	152	92	George Washington University	11
35	University of Virginia	152	93	Duquesne University	9
38	University of Delaware	147	94	University of New Hampshire	8
39	University of North Carolina (all campuses)	144	94	Baylor University	8
40	University of Colorado	142	96	University of South Carolina	6
41	Rutgers, The State University	141	97	Howard University	5
42	University of Kansas	136	97	Montana State College	5
43	Washington University	134	97	University of Akron	5
44	Georgetown University	131	97	University of Hawaii	5
45	Catholic University of America	129	101	University of Alaska	4
46	University of Tennessee	111	101	Texas Technological College	4
47	Wayne State University	109	103	Colorado State University	2
48	Illinois Institute of Technology	108	103	Loyola University (Chicago)	2
49	University of Missouri	105	105	Bradley University	1
50	University of Florida	102	105	Stevens Institute of Technology	1
51	Oregon State University	101	105	New Mexico Institute of Mining and Technology	1
52	Rice University	100	105	University of North Dakota	1
53	University of Southern California	97	105	Ohio University	1
54	Fordham University	94			
55	St. Louis University	93			
55	Western Reserve University	93			

Astronomy

Astronomy is a relatively small field, averaging 23 bachelor's degrees, 16 master's degrees, and 15 doctor's degrees per year. (See table 15.) Over the entire 11-year period of this study, 20.6 percent of the bachelor's degrees, 11.8 percent of the master's degrees, and 10.1 percent of the doctor's degrees were awarded to women.

Not many institutions give degrees in astronomy. In 1959–60, 19 institutions awarded at least one bachelor's degree in astronomy. Between 1949–50 through 1958–59, 16 institutions gave one or more doctorates in astronomy. These institutions, in rank order of number of doctorates conferred, are given in table 16.

ASTRONOMY

Table 15.—Number of degrees in *astronomy*, by level and sex: Aggregate United States, each year 1949–50 through 1959–60

Year ending June 30	Number of degrees			Percent granted to women	Number of institutions that granted astronomy degrees [1]	Year ending June 30	Number of degrees			Percent granted to women	Number of institutions that granted astronomy degrees [1]
	Both sexes	Men	Women				Both sexes	Men	Women		
	Bachelor's Level										
1950	30	26	4	13.3	(*)	1956	19	14	5	26.3	11
1951	27	23	4	15.0	(*)	1957	17	14	3	17.6	11
1952	23	16	7	30.4	(*)	1958	25	17	8	32.0	12
1953	19	15	4	21.1	(*)	1959	28	24	4	14.3	15
1954	13	11	2	15.4	(*)	1960	41	31	10	24.4	19
1955	11	10	1	9.1	9						
	Master's and Other Second-Level										
1950	22	18	4	18.2	(*)	1956	14	14	0	0.0	8
1951	14	12	2	14.3	(*)	1957	13	11	2	15.4	8
1952	22	19	3	13.6	(*)	1958	20	19	1	5.0	8
1953	10	10	0	0.0	(*)	1959	21	18	3	14.3	9
1954	19	16	3	15.8	(*)	1960	10	10	0	0.0	6
1955	13	10	3	23.1	10						
	Doctor's Level										
1950	16	15	1	6.3	(*)	1956	23	20	3	13.0	10
1951	10	9	1	10.0	(*)	1957	8	8	0	0.0	5
1952	14	12	2	14.3	(*)	1958	22	18	4	18.2	10
1953	18	16	2	11.1	(*)	1959	16	16	1	5.9	9
1954	15	13	2	13.3	(*)	1960	11	11	0	0.0	6
1955	16	15	1	6.3	9						

[1] The number of institutions that conferred degrees in a specific discipline was not counted until 1954–55.
* Data not readily ascertainable.

Table 16.—Rank order of institutions with respect to total number of doctorates in *astronomy* granted during 1949–50 through 1958–59: Aggregate United States

Rank order	Institution	10-year total	Rank order	Institution	10-year total
1	Harvard University	29	8	Radcliffe College	6
2	University of California (all campuses)	28	10	Yale University	5
3	University of Chicago	23	11	University of Wisconsin	3
4	University of Michigan	18	12	Columbia University	2
5	Princeton University	14	12	University of Pennsylvania	2
6	California Institute of Technology	11	12	University of Virginia	2
7	Indiana University	7	15	Case Institute of Technology	1
8	Georgetown University	6	15	Northwestern University	1

Chemistry

The number of bachelor's and master's degrees in chemistry [1] declined during the first half of the decade of the 1950's and then in the last half increased but not to the numbers attained in 1949–50. (See table 17.) The number of doctorates did not vary much during this period, approximating about one thousand a year. The percentages that degrees in chemistry were of all degrees declined at each level, indicating that chemistry was losing ground to other disciplines.

Totals for the 11-year period

Over the entire 11-year period of this study were conferred 78,040 bachelor's degrees, 13,638 master's and other second-level degrees, and 11,032 doctor's degrees in chemistry. The percents of all degrees at each level were 2.0, 2.0, and 11.8, respectively, and the percents of these degrees at each level awarded to women were, 17.8, 12.6, and 4.7, respectively. From the number of master's and doctor's degrees awarded in chemistry over the 11 years it appears that if a student gets a master's degree in chemistry he or she will probably continue on to a doctorate.

Number of institutions conferring degrees in chemistry

It is seen from table 17 that the number of institutions granting degrees in chemistry at each level has been increasing, reaching 823 at the bachelor's level, 200 at the master's level, and 100 at the doctor's level in 1959–60. It must be remembered, however, that the number of institutions granting degrees in a specific discipline at a certain level in a given year will not usually represent the total number of institutions authorized to grant these degrees because in some years some of the institutions lack students completing requirements for such a degree.

Doctorate production in chemistry, by institution

Table 18 shows the total number of chemistry doctorates awarded by 108 institutions for the 10-year period, 1949–50 through 1958–59. The institutions are ranked in decreasing order of the total number of degrees each institution awarded during the 10-year period; the first 19 granted more doctorates in chemistry than did the remaining 89.

The University of Illinois heads the list with 577, followed by University of California (all campuses) with 483, Ohio State University with 357, and the University of Wisconsin with 352. It was mentioned at the beginning of this section that biochemistry degrees were excluded from these tabulations. The University of Wisconsin leads in the number of biochemistry doctorates with 244, and University of California (all campuses) is second with 124; University of Illinois conferred 8 and Ohio State University 39 during this same period. If doctorates in both chemistry and biochemistry were included in the tabulation, University of California (all campuses) would head the list with 607 degrees, followed by University of Wisconsin, 596; University of Illinois, 585; and Ohio State University, 396.

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[1] Degrees in biochemistry are not included in these tabulations. In the Office of Education reports, biochemistry is included with the biological sciences. The numbers of biochemistry degrees are relatively small, averaging 144 per year at the bachelor's level, 136 at the master's level, and 132 at the doctoral level.

CHEMISTRY[1]

Table 17.—Number and percent of degrees in *chemistry*, by level and sex: Aggregate United States, each year 1949–50 through 1959–60

Year ending June 30	Number of degrees conferred in chemistry	Chemistry as a percent of degrees in all fields conferred at given level[2]	Number of chemistry degrees awarded to men	Number of chemistry degrees awarded to women	Percent of chemistry degrees awarded to women	Number of institutions that conferred degrees in chemistry[3]
	Bachelor's Level					
1950	10,619	2.45	9,134	1,485	14.0	(4)
1951	8,258	2.15	7,036	1,222	14.8	(4)
1952	6,819	2.05	5,717	1,102	16.2	(4)
1953	5,943	1.95	4,870	1,073	18.1	(4)
1954	5,791	1.98	4,727	1,064	18.4	(4)
1955	5,920	2.06	4,781	1,139	19.2	752
1956	6,178	1.99	4,996	1,182	19.1	730
1957	6,591	1.94	5,297	1,294	19.6	764
1958	7,010	1.92	5,705	1,305	18.6	807
1959	7,308	1.90	5,897	1,411	19.3	808
1960	7,603	1.93	6,005	1,598	21.0	823
	Master's and Other Second-Level					
1950	1,576	2.71	1,368	208	13.2	(4)
1951	1,462	2.25	1,300	162	11.1	(4)
1952	1,409	2.22	1,242	167	11.9	(4)
1953	1,211	1.98	1,095	116	9.6	(4)
1954	1,098	1.93	972	126	11.5	(4)
1955	1,173	2.02	1,036	137	11.7	183
1956	1,164	1.96	1,035	129	11.1	180
1957	1,047	1.69	913	134	12.8	179
1958	1,125	1.72	958	167	14.8	187
1959	1,145	1.65	981	164	14.3	187
1960	1,228	1.65	1,025	203	16.5	200
	Doctor's Level					
1950	953	14.37	914	39	4.1	(4)
1951	1,046	14.26	994	52	5.0	(4)
1952	1,031	13.42	986	45	4.4	(4)
1953	999	12.02	948	51	5.1	(4)
1954	1,013	11.26	968	45	4.4	(4)
1955	1,005	11.37	969	36	3.6	91
1956	986	11.08	934	52	5.3	89
1957	1,003	11.46	955	48	4.8	94
1958	939	10.50	890	49	5.2	96
1959	1,009	10.78	960	49	4.9	97
1960	1,048	10.66	1,000	48	4.6	100

[1] Does not include biochemistry.

[2] For example, the percent at the bachelor's level is based upon all bachelor's and first professional degrees conferred that year.

[3] The number of institutions that conferred degrees in a specific discipline was not counted until 1954–55.

[4] Data not readily ascertainable.

CHEMISTRY [1]

Table 18.—Rank order of institutions with respect to total number of doctorates in *chemistry* granted during 1949–50 through 1958–59: Aggregate United States

Rank order	Institution	10-year total	Rank order	Institution	10-year total
1	University of Illinois	577	56	Vanderbilt University	56
2	University of California (all campuses)	483	57	Washington University	55
3	Ohio State University	357	58	University of Connecticut	52
4	University of Wisconsin	352	59	Tulane University	51
5	Purdue University	338	60	Kansas State University	49
5	Massachusetts Institute of Technology	338	60	Lehigh University	49
7	Iowa State University	259	62	St. Louis University	45
8	University of Minnesota	226	63	University of Buffalo	44
9	Polytechnic Institute of Brooklyn	223	64	Louisiana State University	43
10	Columbia University	221	65	Syracuse University	42
11	Harvard University	220	66	Florida State University	41
12	University of Chicago	204	66	University of Oklahoma	41
13	University of Texas	203	68	University of Cincinnati	39
14	Northwestern University	202	68	Washington State University	39
15	Cornell University	194	70	Oklahoma State University	38
16	Yale University	185	70	Lawrence College (Institute of Paper Chemistry)	38
17	Pennsylvania State University	181	72	Emory University	37
18	University of Michigan	171	73	Rice University	36
19	University of Washington	169	74	University of Kentucky	35
20	University of Notre Dame	163	75	Temple University	34
21	New York University	151	76	Boston University	33
22	University of Delaware	147	77	University of New Mexico	32
23	University of Pennsylvania	144	78	Clark University	29
24	State University of Iowa	135	79	Case Institute of Technology	28
25	Michigan State University	132	80	University of Louisville	27
26	Princeton University	131	81	University of Oregon	25
26	California Institute of Technology	131	82	Agricultural and Mechanical College of Texas	24
28	University of Rochester	127	83	Georgia Institute of Technology	23
29	Georgetown University	125	84	West Virginia University	21
30	Indiana University	119	84	University of Arkansas	21
31	University of Pittsburgh	115	86	University of Alabama	16
32	Stanford University	113	87	University of Massachusetts	15
33	Wayne State University	108	88	Virginia Polytechnic Institute	13
34	University of Colorado	107	89	Radcliffe College	12
34	University of North Carolina, Chapel Hill	107	90	Bryn Mawr College	10
36	University of Maryland	103	91	Duquesne University	9
37	Rutgers, The State University	100	91	University of Wyoming	9
38	University of Kansas	92	93	University of New Hampshire	8
38	Western Reserve University	92	94	Baylor University	7
40	University of Florida	91	94	George Washington University	7
40	Carnegie Institute of Technology	91	96	University of South Carolina	6
42	Duke University	85	97	Montana State College	5
42	Oregon State University	85	97	University of Akron	5
44	Johns Hopkins University	78	97	Howard University	5
44	University of Tennessee	78	97	University of Hawaii	5
44	University of Utah	78	101	Texas Technological College	3
44	University of Virginia	78	102	Loyola University (Illinois)	2
48	Fordham University	76	102	Medical College of Virginia	2
48	Brown University	76	104	University of Arizona	1
50	Rensselaer Polytechnic Institute	70	104	Bradley University	1
51	Illinois Institute of Technology	64	104	Colorado State University	1
52	University of Southern California	62	104	Ohio University	1
53	Catholic University of America	61	104	Stevens Institute of Technology	1
54	University of Missouri	60			
55	University of Nebraska	58			

[1] Does not include biochemistry.

Geology

After a decline from 3,043 bachelor's degrees in geology[1] in 1949–50 to 1,632 in 1953–54, the number of such degrees increased to 2,816 in 1958–59 before decreasing again to 2,428 in 1959–60. (See table 19.) The number of master's degrees varied between 412 and 700 in no consistent pattern over the 11-year period. The number of doctorates did not vary significantly during the

[1] Degrees in geophysics and geochemistry, which are relatively small in number, are not included.

GEOLOGY[1]

Table 19.—Number and percent of degrees in *geology*, by level and sex: Aggregate United States, each year 1949–50 through 1959–60

Year ending June 30	Number of degrees conferred in geology	Geology as a percent of degrees in all fields conferred at given level[2]	Number of geology degrees awarded to men	Number of geology degrees awarded to women	Percent of geology degrees awarded to women	Number of institutions that conferred degrees in geology[3]
	BACHELOR'S LEVEL					
1950	3,043	0.70	2,934	109	3.6	(4)
1951	2,717	0.73	2,643	74	2.7	(4)
1952	2,102	0.63	2,026	76	3.6	(4)
1953	1,719	0.56	1,651	68	4.0	(4)
1954	1,632	0.56	1,553	79	4.8	(4)
1955	1,795	0.63	1,703	92	5.1	189
1956	2,138	0.71	2,060	78	3.6	192
1957	2,548	0.75	2,459	89	3.5	200
1958	2,788	0.76	2,684	104	3.7	199
1959	2,816	0.73	2,725	91	3.2	206
1960	2,428	0.61	2,353	75	3.1	207
	MASTER'S AND OTHER SECOND-LEVEL					
1950	493	0.85	477	16	3.2	(4)
1951	565	0.87	543	22	3.9	(4)
1952	486	0.76	469	17	3.5	(4)
1953	517	0.85	509	8	1.5	(4)
1954	412	0.73	397	15	3.6	(4)
1955	507	0.87	481	26	5.1	86
1956	491	0.87	478	13	2.6	75
1957	548	0.89	532	16	2.9	80
1958	700	1.07	679	21	3.0	89
1959	643	0.93	630	13	2.0	89
1960	574	0.77	560	14	2.4	93
	DOCTOR'S LEVEL					
1950	113	1.70	110	3	2.7	(4)
1951	123	1.68	120	3	2.4	(4)
1952	116	1.51	116	0	0.0	(4)
1953	133	1.60	130	3	2.3	(4)
1954	136	1.51	130	6	4.4	(4)
1955	154	1.74	152	2	1.3	35
1956	128	1.58	127	1	0.8	35
1957	129	1.47	127	2	1.6	37
1958	136	1.52	133	3	2.2	34
1959	184	1.97	179	5	2.7	41
1960	190	1.93	186	4	2.1	44

[1] Does not include geophysics or geochemistry.

[2] For example, the percent at the bachelor's level is based upon all bachelor's and first professional degrees conferred that year.

[3] The number of institutions that conferred degrees in a specific discipline was not counted until 1954–55.

[4] Data not readily ascertainable.

first 9 years but the numbers, 184 in 1958–59 and 190 in 1959–60, showed a large gain over the earlier years.

Totals for the 11-year period

For the 11-year period as a whole the 25,726 bachelor's degrees in geology constituted 0.7 percent of all bachelor's and first professional degrees; the 5,936 master's degrees constituted 0.9 percent of all master's and second-level degrees; and the 1,542 doctor's degrees constituted 1.6 percent of all doctorates. The percentages of geology degrees awarded to women over the same years were 3.6 percent at the bachelor's level, 3.0 at the master's level, and 2.1 at the doctorate level.

Number of institutions conferring degrees in geology.

The numbers of institutions granting geology degrees at each level have been increasing, reaching highs in 1959–60 of 207 at the bachelor's level, 93 at the master's level, and 44 at the doctor's level. It must be remembered, however, that the number of institutions conferring doctorates in geology at any level for a given year will not represent the universe of institutions authorized to grant such degrees because some institutions lack students completing requirements for such degrees.

Doctorate production in geology, by institution

Table 20 shows the number of doctorates in geology conferred by individual institutions for the 10-year period 1949–50 through 1958–59. A total of 54 institutions awarded one or more doctorates over this period. They are ranked in decreasing order of the number of doctorates each conferred. Columbia University heads the list with 143, followed by the University of Wisconsin with 88 and Harvard University with 87. The first nine institutions granted more doctorates in geology than did the remaining 45.

GEOLOGY [1]

Table 20.—Rank order of institutions with respect to total number of doctorates in *geology* granted during 1949–50 through 1958–59: Aggregate United States

Rank order	Institution	10-year total	Rank order	Institution	10-year total
1	Columbia University	143	28	University of Utah	13
2	University of Wisconsin	88	30	University of Southern California	12
3	Harvard University	87	30	University of Oklahoma	12
4	University of California (all campuses)	77	32	Rutgers, The State University	11
5	Stanford University	73	33	Washington University (St. Louis)	9
6	University of Illinois	71	33	Lehigh University	9
7	Princeton University	70	35	Boston University	8
8	University of Chicago	66	35	University of North Carolina	8
9	Yale University	64	37	St. Louis University	6
10	Massachusetts Institute of Technology	53	37	University of Cincinnati	6
11	California Institute of Technology	42	37	University of Wyoming	6
12	University of Michigan	41	40	Washington State University	5
13	Johns Hopkins University	38	41	Bryn Mawr College	4
14	University of Washington	34	42	Iowa State University	3
15	University of Minnesota	33	42	Radcliffe College	3
16	Pennsylvania State University	32	42	University of Nebraska	3
17	Ohio State University	31	42	Rice University	3
18	Cornell University	25	42	Virginia Polytechnic Institute	3
19	University of Arizona	22	47	Michigan State University	2
19	Indiana University	22	47	University of Pittsburgh	2
19	State University of Iowa	22	47	West Virginia University	2
19	University of Texas	22	50	University of Alaska	1
23	Northwestern University	19	50	University of Rochester	1
24	University of Colorado	17	50	University of North Dakota	1
24	Louisiana State University	17	50	University of Tennessee	1
26	University of Kansas	15	50	Agricultural and Mechanical College of Texas	1
27	Syracuse University	14			
28	University of Missouri	13			

[1] Does not include geophysics or geochemistry.

Meteorology

From 1949–50 through 1959–60, the average annual numbers of degrees conferred in meteorology were 114 bachelor's degrees, 61 master's degrees, and 12 doctor's degrees. (See table 21.) Significant increases in the numbers of degrees at the bachelor's and master's levels occurred in the last years of the period covered by this study. Only 29 bachelor's degrees, 13 master's degrees, and 3 doctor's degrees in meteorology were awarded to women over the 11-year period.

Only a small number of institutions confer degrees in meteorology. Nine universities grant such degrees at the doctorate level. These institutions and the number of doctorates each awarded over a 10-year period, 1949–50 through 1958–59, are listed in table 22.

METEOROLOGY

Table 21.—Number of degrees in *meteorology*, by level and sex: Aggregate United States, each year 1949–50 through 1959–60

Year ending June 30	Number of degrees			Percent granted to women	Number of institutions that granted meteorology degrees [1]
	Both sexes	Men	Women		
Bachelor's Level					
1950	143	138	5	3.5	[2]
1951	104	103	1	1.0	[2]
1952	72	70	2	2.8	[2]
1953	102	101	1	1.0	[2]
1954	93	88	5	5.4	[2]
1955	60	58	2	3.3	10
1956	76	74	2	2.6	10
1957	79	77	2	2.5	13
1958	153	149	4	2.6	14
1959	173	170	3	1.7	11
1960	201	199	2	1.0	15
Master's and Other Second-Level					
1950	51	49	2	3.9	[2]
1951	57	56	1	1.8	[2]
1952	91	90	1	1.1	[2]
1953	50	50	0	0.0	[2]
1954	38	38	0	0.0	[2]
1955	45	41	4	8.9	7
Master's and Other Second-Level—Continued					
1956	34	33	1	2.9	11
1957	51	51	0	0.0	13
1958	71	70	1	1.4	13
1959	88	86	2	2.3	13
1960	96	95	1	1.0	14
Doctor's Level					
1950	12	11	1	8.3	[2]
1951	12	12	0	0.0	[2]
1952	10	10	0	0.0	[2]
1953	13	13	0	0.0	[2]
1954	5	4	1	20.0	[2]
1955	2	2	0	0.0	2
1956	10	10	0	0.0	5
1957	22	21	1	4.5	6
1958	14	14	0	0.0	8
1959	11	11	0	0.0	7
1960	21	21	0	0.0	7

[1] The number of institutions that conferred degrees in a specific discipline was not counted until 1954–55.

[2] Data not readily ascertainable.

Table 22.—Rank order of institutions with respect to total number of doctorates in *meteorology* granted during 1949–50 through 1958–59: Aggregate United States

Rank order	Institution	10-year total
1	Massachusetts Institute of Technology	25
2	University of Chicago	22
2	New York University	22
4	University of California (all campuses)	15
4	Pennsylvania State University	15
6	University of Washington	6
7	Florida State University	4
8	Iowa State University	1
8	University of Wisconsin	1

Physics

In 1954–55 there were 1,996 bachelor's degrees conferred in physics.[1] Five years later, in 1959–60, 4,338 or more than double this number were awarded. For the same years the number of master's degrees in physics increased from 729 to 1,073. After a low figure of 358 for 1949–50 the number of doctorates in physics during the period 1950–51 through 1959–60 did not vary appreciably. (See table 23.)

Next to mathematics, physics is the most rapidly growing discipline among the sciences and engineering at the bachelor's level. As was likewise true for mathematics, the 1959–60 figure even exceeded the 1949–50 figure. The percentage that physics degrees at the bachelor's level was of the total of all bachelor's and first professional degrees changed from .79 in 1949–50 to 1.10 in 1959–60, with a small decline in the percentages during the early fifties.

The increase in the number of physics degrees at the master's level was only moderate, and the percentage (1.44) in 1959–60 of all degrees at this level did not reach that of 1.58 attained in 1949–50. Because the number of degrees held fairly constant the percentage at the doctorate level for physics declined, meaning that physics at this level was losing ground on a proportionate basis to other disciplines.

Totals for the 11-year period

For the 11-year period as a whole, the 30,815 degrees conferred in physics at the bachelor's level constituted 0.8 percent of the total number of bachelor's and first professional degrees; the 9,295 master's degrees represented 1.3 percent of the total number of master's and other second-level degrees; and the 5,116 doctor's degrees were 5.5 percent of the total number of earned doctorates (Ph. D., Ed. D., etc.). Thus, it is seen that the percentage of physics degrees of all the degrees awarded at each level rises sharply with the level of degree.

Number of institutions conferring degrees in physics

Undoubtedly accounting for some of the increase in the number of physics degrees conferred at the bachelor's and master's levels was the increase from 1954–55 to 1959–60 in the numbers of institutions that awarded such degrees. At the doctorate level the number of institutions that granted a doctorate in any one year varied only slightly. It must be remembered that the number of institutions giving physics degrees at any level will not usually be the total number because in some years some institutions lack students completing the requirements for such a degree.

Doctorate production in physics, by institution

Table 24 shows the total number of doctorates awarded in physics by individual institution for the 10-year period 1949–50 through 1958–59. The 82 institutions which awarded the degrees are ranked in decreasing order of the total number each awarded during the 10-year period. The first 14 institutions granted more doctorates in physics than did the remaining 68. The University of California (all campuses) heads the list with 426, followed by the Massachusetts Institute of Technology with 318.

[1] Degrees in biophysics and geophysics are not included in these tabulations.

PHYSICS[1]

Table 23.—Number and percent of degrees in *physics*, by level and sex: Aggregate United States, each year 1949–50 through 1959–60

Year ending June 30	Number of degrees conferred in physics	Physics as a percent of degrees in all fields conferred at given level[2]	Number of physics degrees awarded to men	Number of physics degrees awarded to women	Percent of physics degrees awarded to women	Number of institutions that conferred degrees in physics[3]
	Bachelor's Level					
1950	3,414	0.79	3,287	127	3.7	(4)
1951	2,788	0.73	2,671	117	4.2	(4)
1952	2,247	0.68	2,141	106	4.7	(4)
1953	2,005	0.66	1,921	84	4.2	(4)
1954	1,952	0.67	1,877	75	3.8	(4)
1955	1,996	0.70	1,920	76	3.8	421
1956	2,335	0.75	2,233	102	4.4	425
1957	2,745	0.81	2,623	122	4.4	446
1958	3,186	0.87	3,042	144	4.5	490
1959	3,809	0.99	3,668	141	3.7	503
1960	4,338	1.10	4,166	172	4.0	537
	Master's and Other Second-Level					
1950	922	1.58	888	34	3.7	(4)
1951	973	1.49	934	39	4.0	(4)
1952	886	1.39	851	35	4.0	(4)
1953	721	1.18	686	35	4.9	(4)
1954	714	1.26	685	29	4.1	(4)
1955	729	1.25	701	28	3.8	131
1956	742	1.25	719	23	3.1	128
1957	825	1.33	797	28	3.4	128
1958	795	1.21	770	25	3.1	133
1959	915	1.32	885	30	3.3	142
1960	1,073	1.44	1,038	35	3.3	153
	Doctor's Level					
1950	358	5.40	353	5	1.4	(4)
1951	443	6.04	435	8	1.8	(4)
1952	485	6.31	476	9	1.9	(4)
1953	478	5.75	472	6	1.3	(4)
1954	485	5.39	479	6	1.2	(4)
1955	511	5.78	499	12	2.3	70
1956	470	5.28	462	8	1.7	70
1957	453	5.17	439	14	3.1	70
1958	464	5.19	455	9	1.9	68
1959	482	5.15	473	9	1.9	68
1960	487	4.95	477	10	2.1	70

[1] Does not include biophysics or geophysics.

[2] For example, the percent at the bachelor's level is based upon all bachelor's and first-professional degrees conferred that year.

[3] The number of institutions that conferred degrees in a specific discipline was not counted until 1955.

[4] Data not readily ascertainable.

PHYSICS [1]

Table 24.—Rank order of institutions with respect to total number of doctorates in *physics* granted during 1949–50 through 1958–59: Aggregate United States

Rank order	Institution	10-year total
1	University of California (all campuses)	426
2	Massachusetts Institute of Technology	318
3	Columbia University	175
4	Harvard University	162
5	University of Illinois	159
6	Cornell University	150
7	Yale University	147
8	Ohio State University	139
9	University of Chicago	132
10	University of Wisconsin	130
11	California Institute of Technology	127
12	University of Michigan	122
13	Princeton University	111
14	New York University	110
15	University of Texas	101
16	Johns Hopkins University	94
17	Stanford University	90
18	Carnegie Institute of Technology	86
19	University of Pennsylvania	79
20	University of Rochester	78
21	Duke University	75
22	University of Virginia	72
23	Iowa State University	71
24	Washington University	70
25	Purdue University	69
26	Catholic University of America	68
27	Pennsylvania State University	61
27	Rice University	61
29	Brown University	57
30	University of Maryland	54
30	Indiana University	54
32	University of Minnesota	53
33	University of Notre Dame	51
34	University of Washington	47
35	Illinois Institute of Technology	37
35	University of Pittsburgh	37
37	Case Institute of Technology	35
38	State University of Iowa	34
38	Michigan State University	34
38	St. Louis University	34
41	Vanderbilt University	33
42	Northwestern University	31
43	Rutgers, The State University	30
44	Syracuse University	29
44	University of North Carolina, Chapel Hill	29
44	University of Utah	29
44	University of Kansas	29
44	University of Tennessee	29
49	University of Missouri	27
50	University of Oklahoma	25
50	Lehigh University	25
52	University of Southern California	23
53	Louisiana State University	22
54	Polytechnic Institute of Brooklyn	21
54	Rensselaer Polytechnic Institute	21
56	Fordham University	18
56	University of Cincinnati	18
58	University of Colorado	16
58	Temple University	16
60	Boston University	15
60	Oregon State University	15
62	University of Buffalo	14
63	Agricultural and Mechanical College of Texas	13
64	University of Florida	11
65	University of Oregon	10
66	University of Connecticut	9
67	University of Kentucky	8
67	University of Nebraska	8
67	Washington State University	8
70	University of Alabama	6
70	Radcliffe College	6
70	University of New Mexico	6
73	Kansas State University	4
73	George Washington University	4
75	Florida State University	3
75	Georgia Institute of Technology	3
77	Colorado State University	1
77	Emory University	1
77	Wayne State University	1
77	Bryn Mawr College	1
77	Baylor University	1
77	Western Reserve University	1

[1] Does not include biophysics or geophysics.

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